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Abstract[*]

This paper analyzes the problem of sub-national revenue mobilization in Peru and proposes several policy reforms to improve collection performance while maintaining a sound revenue structure. In particular, the paper analyzes the current revenues of regional and municipal governments and identifies the main priorities for reform. Among the most important problems are the acute inequalities and inefficiencies associated with revenue sharing from extractive industries. These revenues represent a significant share of sub-national budgets and currently they are distributed without consideration of the relative expenditure needs or fiscal capacity of sub-national units. In order to address this problem, the paper proposes the incorporation of a measure of fiscal capacity into the formula of the FONCOMUN, the municipal equalization transfer program. Other reforms explored include the reassignment of revenue sources between municipal provincial and district governments and the assignment of new taxes to regional governments.

JEL classifications: H11, H21, H71, H73
Keywords: Revenue mobilization, Fiscal decentralization, Peru

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Abbreviations and acronyms (and translations)

DGAES	General Directorate of Economic and Social Affairs (*Dirección General de Asuntos Económicos y Sociales*)
DNCP	National Directorate of Public Accounts (*Dirección Nacional de Contabilidad Pública*)
ECLAC	Economic Commission for Latin America and the Caribbean
FONCOMUN	Municipal Compensation Fund (*Fundo de Compensación Municipal*)
FONCOR	Regional Compensation Fund (*Fondo de Compensación Regional*)
INEI	National Institute of Statistics and Information (*Instituto Nacional de Estadística e Informática*)
MEF	Ministry of Economy and Finances (*Ministerio de Economía y Finanzas*)
RENAMU	National Registry of Municipalities (Registro Nacional de Municipalidades)
SAT	Tax Administration Service (*Servicio de Administración Tributaria*)
DS	Supreme Decree (*Decreto Supremo*)
SUNAT	National Superintendence of Tax Administration (*Superintendencia Nacional de Administración Tributaria*)
UIT	Tributary Tax Unit (*Unidad Impositiva Tributaria*)

1. Introduction

The current fiscal decentralization process in Peru began in 2002 with an amendment to the Constitution and Legislative Decree No. 955, the current Fiscal Decentralization Law. Since then, decentralization reform has been at the center of national and sub-national political agendas. After eight years the process is in some respects relatively advanced; the legal framework covers most aspects of the system of intergovernmental fiscal relations, and each group of sub-national governments (regional and local) in the aggregate commanded about 20 percent of total public expenditures in 2009.

However, there are still important aspects of the process that remain problematic and which will require substantial reform efforts. In a context of acute inter-jurisdictional fiscal inequalities, with a few significant exceptions, sub-national governments are currently not collecting sizeable amounts of revenues on their own. This might be due to a number of reasons, including lack of administrative and technical capacity or simply sub-national authorities' interest in avoiding the economic and political costs of own revenue collections. Indeed, most sub-national governments are highly dependent on intergovernmental transfers.

In this paper we attempt to identify the main factors explaining the poor revenue collection performance of sub-national governments in Peru, and propose policy reforms to improve revenue mobilization, paying particular attention to their feasibility. Because government units at the local and regional levels face diverse institutional conditions, we use different analytical approaches and provide separate strategies to improve revenue collection performance at those two levels of government. At the local level, with a few exceptions, current tax assignments roughly follow best international practices; thus our analysis focuses on possible reforms to improve tax collections performance. On the other hand, there are still no tax instruments assigned to regional governments, so in this case we suggest alternative approaches to provide them with own revenue sources and create fiscal autonomy and accountability.

Because they are closely interconnected in Peru, we propose to address the problem of revenue mobilization together with the problem of unequal distribution of fiscal resources caused by the current arrangements for revenue sharing from extractive industries on a derivation basis. Besides the obvious costs imposed on the cohesiveness of society on equity grounds, the current extent of inter-jurisdictional inequalities in Peru also imposes efficiency costs that have not been sufficiently stressed in prior analyses of the Peruvian decentralization process. These efficiency

losses are produced by the different expenditure decision rules, resulting from the unequal fiscal conditions across sub-national governments. This is perhaps the most important message of this paper: improving revenue mobilization in Peru requires a systemic approach, in which equity and efficiency are addressed simultaneously while sub-national governments are provided with both the ability and the incentives to maximize own revenue collections.

We present alternative methodologies to estimate the fiscal capacity or revenue potential of sub-national governments, and propose to incorporate one of these measures into the distribution formula of the equalization transfer program currently implemented at the local and regional levels. The main goal of this proposed reform component is to improve the equalizing power of the current equalization transfer programs by virtually excluding from the grant those sub-national governments receiving significant revenues from extractive industries. We discuss why this would seem to be a fiscally and politically feasible approach to improving the equity and efficiency of the Peruvian fiscal decentralization system.

The rest of the paper is structured as follows. Section 2 describes the current revenue structure of regional and local governments. Section 3 present an econometric analysis of the determinants of revenue collections at the local level and identifies some priorities for reform at that level. Section 4 examines the municipal compensation fund and other transfers to local governments. Section 5 describes several alternative methodologies to measuring revenue potential, which could be incorporated into the distribution formula of the equalization transfer programs in Peru, and analyzes the results of their application. Section 6 proposes alternative sources of revenue autonomy for regional governments. Section 7 summarizes the reform proposals. Section 8 discuses some of the relevant political economy considerations surrounding the proposals. Section 9 concludes.

2. The Current Revenue Structure of Sub-national Governments in Peru

Since the beginning of the current decentralization process in Peru, sub-national governments have represented a significant share of the total public budget. During 2002, total expenditures at the sub-national level reached almost 14 billion nuevos soles (see Table 1), representing 39.5 percent of total expenditures by the central and sub-national governments.[1] More recently, in 2008, the share of sub-national expenditures has declined slightly, but still remains quite

[1] The available data for 2002 do not distinguish between regional and municipal governments.

significant. The sum of regional and local expenditures was around 25 billion nuevos soles, or 36.6 percent of general government outlays. In spite of this decline, the decentralization of expenditures has deepened, as a great number of responsibilities have been assigned to sub-national governments during the period.[2] In contrast, the decentralization of revenue sources remains quite insignificant. In 2002 the share of own revenues in total expenditures for sub-national governments was 11 percent, and in 2008 this share rose to only 12.3 percent, with local governments collecting most of these revenues.

Such a low share of own revenues implies a great reliance on intergovernmental transfers. In Table 1 we present the government budgets as they are organized by the National Directorate of Public Accounts (DNCP is the acronym in Spanish), the official source of public budget accounts in Peru, but they can be misleading. In 2008 regional governments received 9,104 million nuevos soles in transfers classified as "ordinary resources" (not in the table) which are not reported as revenues, but finance most of the de-concentrated regional expenditures on education, health, social protection and pensions, among other areas.[3] What this means is that the negative "financial results" obtained by sub-national governments in 2002 and regional governments in 2008 (on the bottom of Table 1) are, in reality, covered by transfers from the central government.

The great importance of intergovernmental transfers for the financing of sub-national governments in Peru leads to a number of problems that have been well documented in the decentralization literature. On the one hand, dependency on revenues from transfers limits the efficient behavior and accountability of sub-national authorities. Sub-national autonomy, now on the expenditure side, is further reduced because most of the transfers are conditional to centrally determined uses.

[2] USAID/Perú ProDescentralización (2010a) provides a recent review of the process of transfer of functions to sub-national governments.

[3] The term "de-concentration" is used in the literature to refer those assignments in which sub-national authorities have very limited or no decision making autonomy, while the concept of decentralization implicitly designates a significant degree of autonomy. The amount of ordinary resources is determined annually by the DNCP in an historical basis, and the use of these funds is largely subject to central government guidelines. An analysis of de-concentrated expenditures at the regional level in Peru is provided in World Bank (2009).

Table 1. Composition of Revenues by Level of Government, 2002 and 2008 (in millions of nuevos soles, and percent shares of total expenditures by level of government)

	2002				2008					
	Central government	%	Sub-national governments	%	Central government	%	Regional governments	%	Local governments	%
Own Revenues	**24,939**	**116.6**	**1,530**	**11.0**	**60,438**	**136.0**	**459**	**3.7**	**2,688**	**20.4**
Taxes and contributions	22,429	104.9	731	5.2	51,470	115.8	14	0.1	1,406	10.7
Charges and fees	965	4.5	966	6.9	3,922	8.8	222	1.8	1,583	12.0
Capital Revenues	1,350	6.3	41	0.3	325	0.7	14	0.1	25	0.2
Transfers (*)	**-240**	**-1.1**	**1,436**	**10.3**	**-827**	**-1.9**	**2,365**	**19.0**	**8,629**	**65.4**
From extractive industries			793	5.7			1,669	13.4	5,145	39.0
Net financial debt	97	0.5	-51	-0.4	-844	-1.9	67	0.5	120	0.9
Accumulated balances	267	1.2	466	3.3	5,317	12.0	2,669	21.4	5,170	39.2
Total revenues	**26,414**	**123.5**	**3,421**	**24.6**	**64,409**	**144.9**	**5,574**	**44.7**	**16,633**	**126.1**
Total expenditures	**21,383**	**100.0**	**13,933**	**100.0**	**44,456**	**100.0**	**12,479**	**100.0**	**13,194**	**100.0**
Financial result	5,032	23.5	-10,512	-75.4	19,953	44.9	-6,905	-55.3	3,439	26.1

(*) The full amount of property income of Regional and Municipal Governments during 2002 (usually reported as current revenues in the Peruvian Accounts system) is assumed to correspond to transfers from canon, sobrecanon and royalties.
Source: MEF and DNCP.

On the other hand, some regional and municipal governments in Peru are entitled to sharing in the income tax on certain extractive industries, in the form of the canon, sobrecanon and royalties.[4] These revenues, which are distributed on an origin basis, increased dramatically

[4] According to Law 27506, the canon is the share of local and regional governments in the rents and revenues obtained by the State from natural resources. The sobrecanon has the same basis as the canon and consists of additional sharing of oil revenues that are specific to the regions of Loreto, Ucayali, Piura and Tumbes. The main source of royalties is the mining sector. Law 28258 defines mining royalties as a payment to the State for the right to exploit mining resources and describes the computation procedure and the distribution criterion.

between 2004 and 2008 due to the escalating trend of international prices for Peruvian exports of natural resources. This resulted in severe geographical fiscal disparities and threatened the effectiveness of central government macroeconomic policy. The revenues from canon, sobrecanon and royalties represented up to 26.5 percent of total sub-national expenditures and 2.2 times the amount of sub-national own revenue collections in 2008. Since the central authorities are not able by law to alter the amount of these transfers (although they have been able to impose certain conditions to their use), we can infer that at any time a fairly volatile 10 percent of the general government budget can follow policy directions that diverge significantly from those designed by the central government.

In the rest of this section we first take a closer look at the two most sensitive issues related to the structure of sub-national financing, transfer dependency and the criteria used to distribute revenues from extractive industries, and then we describe in more detail the current structure of revenues at the regional and local levels.

2.1 Dependency on Intergovernmental Transfers and the Problem of Vertical Imbalances

The magnitude of intergovernmental transfers is usually associated with the concept and measurement of vertical imbalances (or the vertical fiscal gap). Vertical imbalances, roughly defined as the "non-correspondence between [own] revenue sources and expenditure commitments for each level of government" (Hunter, 1974, p. 481, brackets added), are common occurrences even in mature, well-designed and fiscally decentralized systems of government. The literature on fiscal federalism has long agreed on the efficiency advantages of sub-national governments in certain expenditure decisions (Stigler, 1957; Musgrave, 1959; Oates, 1968, 1972), but taxpayers' mobility and the presence of economies of scale in tax administration and enforcement also suggest that it might be efficient to retain some of the most relevant revenue sources at the central level (for example, the value added tax—VAT, the corporate income tax, or a progressive personal income tax.) An optimal decentralization of expenditure responsibilities and revenue sources, therefore, will likely lead to fiscal structures in which the central government must provide sub-national governments with transfers to compensate for their inability to raise in own revenues all the funds that they need.

It is difficult to estimate with precision the extent of vertical imbalances. The concept of vertical imbalance implicitly requires the definition of standards for each level of government in

regard to both the quality of public services provision (leading to the concept of expenditure needs) and the ability and effort exerted in the collection of own revenues (leading to the concept of fiscal capacity). Expenditure needs can be defined as the amount of public funds required to provide public services of a given standard of quality. Fiscal capacity, or own revenue potential, can be defined as the amount of revenues that a government or level of governments can collect by exerting a given level—for example, average—of fiscal effort. Of course, any adjustment in the quality standard of public services or the standard level of effort will affect the size of the vertical imbalance.[5] Lacking any better methodology, one might presume that the budgetary process implicitly defines the affordable and desired—if not entirely correct—expenditure and revenue standards, but this is certainly a strong assumption. Unfortunately, it seems that in practice any estimate of vertical imbalances must rely to some extent on current budgetary data.

In its simplest form, the vertical imbalance for sub-national governments can be defined as a ratio of the difference between own revenue and total expenditures to total expenditures. Even though the actual amount of transfers will likely differ from the gap between expenditure needs and fiscal capacity, this measure at least reports the extent to which sub-national governments are relying on funding that they do not raise on their own. Moreover, it turns out that the degree of dependency on external funding, or the mirroring concept of fiscal autonomy, is a central concept in the fiscal decentralization literature. The greater the fiscal autonomy of sub-national authorities, the more accountable they would be for their expenditure and revenue decisions and the stronger their incentives to behave efficiently.

In his seminal paper, Hunter (1974) proposed several measures of vertical imbalance based on the ability of sub-national governments to influence the amount of revenues and thus the level of expenditures. The literature on the measurement of vertical imbalance has grown significantly, but it remains closely related with the problem of revenue autonomy. Alternative measures of vertical imbalance incorporate adjustments to the basic measure based on the share of transfers in total expenditures.[6] Examples of these adjustments are the amount of transfers and lending between levels of sub-national governments, which are mostly irrelevant in the

[5] Bird and Tarasov (2004) suggest that the vertical imbalance can be considered to be "closed" when the richest government at a certain sub-national level is able to fully finance its expenditure responsibilities. Note, however, that this notion of vertical imbalance implicitly defines a standard of fiscal capacity (the ability and effort of the richest government to collect own-revenues) and also a standard of expenditure needs (equal to actual expenditures of the same government).

[6] See Bird and Tarasov (2004) for a review and application of the traditional measures of vertical imbalance and Winer and Hettich (2010) for a discussion and extension of the concept.

Peruvian case. Because of this reason, the most appropriate measure of vertical imbalance seems to be the simple transfers-expenditure ratio. Considering all sub-national governments together (regional and local) this measure in Peru is equal to 88.7 percent in 2002 and 87.6 percent in 2008. We can conclude that, overall, the vertical imbalance or the dependency on transfers has remained fairly high and basically unaltered during the decentralization era.[7] Separating the two tiers of sub-national governments, the picture is slightly altered. In particular, during 2008 the measure of fiscal imbalance for regional governments is equal to 96.2 percent and for local governments 79.4 percent. Of course, the lower vertical imbalance observed at the local level is explained by the fact that they are assigned more significant, although still not substantial nor sufficiently exploited, own-revenue sources.

High dependency on transfers—or an insufficient level of revenue autonomy—is a key aspect of the sub-national revenue structure in Peru. Ahmad and Brosio (2004) have argued that the small share of own-revenue collections in the sub-national budget has, in general, reduced the accountability of sub-national authorities and produced a soft budget constraint problem in Latin America. The same diagnosis is applicable to Peru, where Ahmad and García-Escribano (2011) have called for the implementation of financing mechanisms that can effectively help to increase local accountability.

2.2 The Distribution of Revenues from Extractive Industries and the Problem of Horizontal Imbalances

Another important issue also framing sub-national revenue mobilization in Peru is the unequal distribution of shared revenues from extractive industries on an origin basis, given the location of natural resources. In particular, Law No. 27506 (Law on the Canon) establishes both the total share of sub-national governments on the revenues collected through the income tax on extractive industries (which is generally 50 percent), as well as the procedure to compute the share that corresponds to each sub-national government.[8] Table 2 summarizes this distribution

[7] Based on the data in Table 1, these estimates are equal to one minus the share of own and capital revenues over total expenditures.

[8] We focus here only on the distribution procedures for the canon from mining, gas, hydro energy, fishing and forestry, which represent 77 percent of total revenues from extractive industries for sub-national governments in 2008. The distribution of oil canon and sobrecanon (14 percent of sub-national revenues from extractive industries) is also based on geographical shares but they vary in each region. The distribution of mining royalties (7 percent of regional revenues from extractive industries) is governed by Law No. 28258 of 2004, which defines the same beneficiaries and distribution factors but assigns different shares to each beneficiary. For more details about the

procedure. The beneficiaries are the districts, provinces or regions where the extraction activities take place, and no direct transfer from this revenue source is made to jurisdictions outside those geographical areas.

Table 2. Distribution Procedure for Revenues from Canon

Share	Beneficiaries	Distribution Criteria
10%	District municipalities within which the natural resources are exploited	Equal share
25%	Municipalities of the province within which the natural resources are exploited	Population and Unmet Basic Needs
40%	Municipalities of the region within which the natural resources are exploited	Population and Unmet Basic Needs
25%	80% to Regional Government, and 20% to the universities in the region	

Note: the criteria are applicable to the revenues collected from the exploitation of mining, gas, hydro-energetic, fishing and forest resources (excludes oil canon).
Source: Law No. 27506 (Law on the Canon).

The academic literature and international experience provide no clear guidelines regarding the way tax revenues from extractive industries should be allocated, both between the central and sub-national governments and among the territories where the exploitation of natural resources takes place.[9] In general, more than a matter of economic efficiency, the assignment of property rights to natural resources (and their rents) is a problem that each country must solve in accordance with peculiar considerations involving political, cultural and even historical perspectives. However, it is important to understand and address the economic consequences of the assignments at which every country arrives.

The distribution of revenues on an origin (also called derivation) basis generally creates horizontal imbalances, because the location of natural resources cannot be expected to be correlated with the relative expenditure needs or fiscal capacities of the beneficiary governments.

distribution of revenues from extractive industries see, for instance, Gómez, Martínez-Vázquez and Sepúlveda (2009b).

[9] See, for example, Bahl (2002) and Searle (2007) for discussions about the problem of distributing revenues from extractive industries and reviews of the international experiences.

Even if the distribution criterion is defined according to common determinants of expenditure needs like the population and unmet basic needs, as is the case in Peru, the problem of horizontal imbalances remains between beneficiaries and non-beneficiaries.[10] Besides the obvious problem of inequalities, horizontal imbalances can also create inefficiencies, as they unevenly alter the marginal cost of funds face by different government units (Martínez-Vázquez and Sepúlveda, 2011). Moreover, both inequalities and inefficiencies can be expected to increase with the amount of transfers distributed. This is a critical issue in Peru, where transfers from extractive industries represent around a quarter of total sub-national expenditures, and where there are currently no effective compensating mechanisms to reduce the distortions imposed by the system.

2.3 Revenue Structure at the Regional Level

The current situation with revenue assignments and mobilization is starkly different for regional and local governments. Even though regional governments have been given additional responsibilities, they have not yet been assigned any tax revenue source, and thus their revenue autonomy is negligible and includes only some charges and fees. Table 3 presents the composition of regional revenues during 2004, 2006 and 2008. Transfers have historically been the main revenue source for regional governments, remaining over 95 percent of total revenues during the period. The most important source of transfers to regional governments is, by far, transfers from "ordinary resources," which represent more than two-thirds of total regional revenues in 2008. The distribution of ordinary resources to regional governments is based on historical costs of regional expenditure functions, although they are also subject to upward corrections upon request to the central authorities and upon availability of resources after primary budgetary assignments. Ordinary resources include salaries, pensions, goods and services, donations and other expenses, which are mainly devoted to "de-concentrated" functions in education and health. The large share of ordinary resources in regional revenues is, therefore, related with the fact that regional governments are not given much expenditure autonomy, such that the decentralization process at the regional level is still in a very early stage.

[10] The index of unmet basic needs is defined as the percentage of the population with at least one basic need that has not been satisfied. The basic needs considered in the index are electricity, water and sewage services.

Table 3. Composition of Regional Revenues, 2004, 2006 and 2008
(in millions of nuevos soles, and percent shares of current and capital revenues)

	2004	%	2006	%	2008	%
Own revenues	**303**	**4.1**	**421**	**4.1**	**632**	**4.7**
Taxes and contributions	2	0.0	13	0.1	13	0.1
Charges and fees	160	2.2	199	1.9	217	1.6
Other	141	1.9	209	2.0	402	3.0
Transfers	**7,096**	**95.8**	**9,882**	**95.7**	**12,803**	**95.2**
Ordinary resources	6,027	81.3	7,857	76.1	9,094	67.6
Canon, sobrecanon and royalties	350	4.7	956	9.3	1,669	12.4
Mining Canon	107	1.4	441	4.3	970	7.2
Oil canon and sobrecanon	189	2.6	281	2.7	365	2.7
Gas canon	18	0.2	99	1.0	188	1.4
Other canon and royalties	36	0.5	136	1.3	146	1.1
Custom duties	78	1.1	112	1.1	153	1.1
FONCOR	360	4.9	430	4.2	674	5.0
Others	281	3.8	527	5.1	1,213	9.0
Current Revenues	**7,399**	**99.9**	**10,303**	**99.8**	**13,435**	**99.9**
Capital revenues	11	0.1	25	0.2	14	0.1
Current and capital revenues	**7,410**	**100.0**	**10,328**	**100.0**	**13,449**	**100.0**

Source: MEF and DNCP.

The second most important source of transfers in 2008 is from extractive industries (canon, sobrecanon and royalties), which represents more than 12 percent of total regional revenues.[11] The FONCOR, the equalization transfer program at the regional level, is also a significant revenue source, but in 2008 it contributed less than half of the revenues coming from the canon, sobrecanon and royalties. However, note that in 2004 before the rapid increase in the international prices of natural resources preceding the global financial crisis, the revenues coming from the canon, sobrecanon and royalties and those from FONCOR were roughly equivalent. In all, the relative importance of revenues from extractive industries increased significantly during the period as long as the rising trend of international prices of Peruvian exports persisted.

To get an idea of their variability, in Table 4 we present the basic statistics for the distribution of transfers from extractive industries and the FONCOR across regional governments for 2004 and 2008. In 2004 the amounts of revenue distributed from both sources were quite similar, but the maximum per capita transfers from extractive industries (corresponding to the region of Loreto) was almost double the maximum amount provided by the FONCOR (to the region of Moquegua). The greater concentration of revenues from extractive industries in fewer regional governments is confirmed by the two measures of variability, the coefficient of variation and the range between minimum and maximum per capita transfers over the (weighted) average, which are much higher for this source of revenues. Similar results are obtained for the year 2008, but the differences between the maximum per capita revenues and the variability are even more acute. Tacna, a region rich in mining resources, received four times more revenues from the canon than Apurimac, the region most benefited by the FONCOR.

The FONCOR is distributed according to population, a measure of unmet basic needs, location (population close to the border), and effectiveness in the execution of the investment budget. Even though these transfers are meant to be used only for capital investment purposes and related expenses, the potential fungibility of money within budgets is likely to allow, at least in principle, for a fairly effective equalizing effect. However, the greater magnitude and variability of revenues from extractive industries with respect to the FONCOR suggests that the equalizing potential of the latter may be significantly limited. Moreover, provided that the

[11] Taxes and contributions consist exclusively of import duties collected by Tacna.

FONCOR considers factors that are related to expenditure needs, the fact that the correlation between the two revenue sources was close to zero in 2004 implies that the revenues from extractive industries are independent from expenditure needs, while the greater negative correlation observed in 2008 suggests that they have actually moved in opposite directions.

Table 4. Variability of Regional Revenues from Extractive Industries and FONCOR, 2004 and 2008 (in nuevos soles per capita)

	2004		2008	
	Extractive industries	**FONCOR**	**Extractive industries**	**FONCOR**
minimum	0.0	0.4	0.0	1.4
maximum	118.4	65.4	647.3	134.3
(region)	(Loreto)	(Moquegua)	(Tacna)	(Apurimac)
simple average	21.3	24.5	101.0	43.1
weighted average	13.3	13.7	60.0	24.2
standard deviation	32.3	18.0	153.5	39.5
coefficient of variation (*)	2.4	1.3	2.6	1.6
(max - min)/average	8.9	4.7	10.8	5.5
correlation:	-0.02		-0.28	

(*) The coefficient of variation is equal to the standard deviation divided by the weighted average.
Source: Authors' calculations based on MEF data.

In 2009, through Ministerial Resolution No. 322-2009-EF-15, the General Directorate of Economic and Social Affairs (DGAES) introduced a new methodology to compute FONCOR transfers, which should significantly improve their equalizing power. Under the new methodology, the aforementioned factors are used to compute the capital expenditure needs of each regional government, and then the net capital expenditure needs are obtained by subtracting from this amount the revenues received from canon, sobrecanon, royalties and customs duties. Finally, the transfer is distributed proportionally among regional governments with positive net

capital expenditure needs. As a result, governments for which the revenues from extractive industries exceed their capital expenditure needs receive no transfers from the FONCOR, and the available resources can be concentrated exclusively on the regions where there is insufficient funding for capital expenditures.[12]

This reform was designed to be implemented gradually during a period of three years, and provides a suggestive mechanism for reducing the distortions imposed by the revenues from extractive industries and enhancing equity and efficiency in the system of sub-national government finances in Peru. Indeed, what this reform has done is simply to introduce into the equalization transfer formula an adjustment for the revenues obtained from natural resources, which is one of the most important components of sub-national fiscal capacity in Peru.[13] As we will see below, the municipal equalization transfer, the FONCOMUN, still lacks an equivalent adjustment to account for revenues from natural resources. Ideally, in the future both the FONCOR and FONCOMUN will take into account other determinants of fiscal capacity beyond natural resources.

2.4 Revenue Structure at the Municipal Level

Decree Law No. 776 defines the revenue sources for municipal governments in Peru. In particular, it establishes taxes on property as the main tax revenue sources for provincial and district municipalities. Provinces are assigned the tax on vehicle property, and districts are assigned the tax on land and buildings and the tax on property transfers. Table 5 summarizes the composition of current revenues at the municipal level in Peru. Even though municipalities enjoy a certain degree of tax autonomy that is absent at the regional level, the revenues actually collected from these sources are not especially relevant. As an indication of this, note that total own tax collections have been historically lower than the sum of charges and fees, which include street cleaning, road tolls, parks maintenance, public safety services and construction permits.

High dependency on intergovernmental transfers is also an important concern at the local level. Overall, transfers represent 75 percent of the municipal budget in 2008, with the transfer

[12] The current weights for the distribution factors are 51 percent for population, 43 percent for unmet basic needs, 3 percent for border population and 3 percent for effectiveness in investment budget execution. Even though the latter two factors might not be good determinants of expenditure needs, they only account for 6 percent of the computation, leaving 94 percent to population and unmet basic needs, which are more adequate proxies for needs.

[13] Gómez, Martínez-Vázquez and Sepúlveda (2009a, 2009b) propose and illustrate this type of adjustment for FONCOMUN and FONCOR in Peru.

revenues from extractive industries and the municipal compensation transfer fund (FONCOMUN) being the two most important sources, representing around 40 and 25 percent of sub-national revenues, respectively, in 2008.

Table 5. Composition of Current Revenues at the Municipal Level in 2004, 2006 and 2008 (in millions of nuevos soles, and percent shares of current revenues)

	2004	%	2006	%	2008	%
Taxes	**638**	**11.1**	**720**	**9.6**	**1,296**	**9.9**
Property	532	9.3	627	8.4	1,130	8.6
Vehicle property	61	1.1	57	0.8	95	0.7
Property (land and buildings)	407	7.1	462	6.2	615	4.7
Property transfer (*alcabala*)	64	1.1	108	1.4	421	3.2
Others	106	1.8	93	1.2	166	1.3
Other own revenues	**1,441**	**25.1**	**1,407**	**18.8**	**1,963**	**15.0**
Charges and fees	1,032	18.0	1,010	13.5	1,336	10.2
Others	409	7.1	396	5.3	627	4.8
Transfers	**3,670**	**63.8**	**5,369**	**71.6**	**9,813**	**75.1**
Canon, Sobrecanon and Royalties	705	12.3	2,428	32.4	5,145	39.4
Mining canon	324	5.6	1,248	16.6	3,341	25.6
Mining royalties	0	0.0	299	4.0	401	3.1
Oil canon and sobrecanon	220	3.8	381	5.1	579	4.4
Gas canon	54	0.9	297	4.0	546	4.2
Other canon and royalties	107	1.9	203	2.7	277	2.1
FONCOMUN	1,729	30.1	2,323	31.0	3,257	24.9
Others	1,236	21.5	618	8.2	1,411	10.8
Current revenues	**5,749**	**100.0**	**7,495**	**100.0**	**13,073**	**100.0**

Source: MEF and DNCP.

Decree Law No. 776 also establishes the tax rates to be applied in each case and the sharing of collections between provinces and districts. A summary of these regulations is presented in Table 6. From that information it is clear that local governments in Peru are given no autonomy either to define their tax bases or set the rates for the taxes assigned them. All these decisions are determined centrally. Therefore, the local choice about how much to collect is confined to the realm of tax administration and enforcement efforts.

The lack of autonomy to define local tax policy is not, however, the only important obstacle to local revenue mobilization in Peru. For instance, tax morale and the attitudes of government officials may play a relevant role in limiting the amount of tax revenue collections. According to Alfaro and Rühling (2007), a substantial share of Peru's population still does not appear to fully understand, or does not accept, its supporting role in the financing of the local public goods and services they receive, while some local authorities accept, rather passively, the fundamentally voluntary contributions of taxpayers.

In addition, many municipalities, especially those in rural areas, do not have the administrative and technical capacity to collect significant amounts of tax revenues. For example, a significant number of local governments do not have a complete cadastre of properties, and the existing cadastres are not regularly updated (Alfaro and Rühling, 2007). Although widely recommended as a source of local own revenues, the collection of the property tax is in practice very difficult and expensive.[14] Martínez-Vázquez, Noiset and Rider (2010) review international practices in the decentralization of the property tax and show that the central government plays a significant role in the administration of this revenue source in many countries. The difficulties in administrating and collecting the property tax sometimes make the involvement of the central government an advisable strategy for improving performance in some of the most cumbersome tasks, especially in developing countries like Peru. In a group of 75 countries at different stages of development (among which only 13 countries do not accrue the revenues of the property tax to sub-national governments), Martínez-Vázquez, Noiset and Rider (2010) observe that the central government is (exclusively) assigned the registration of properties in 44 percent of cases, and carries out the billing and collection of the tax in 24 percent of the countries in the sample. The responsibilities of the central government in the administration of

[14] There is an extensive literature supporting the assignment of the property tax to local governments. See Oates (1999) and Bahl, Martínez-Vázquez and Youngman (2008, 2010) for discussions about the advantages and disadvantages of local property taxation.

the property tax are found to be greater in developing countries than in developed countries, but the difference is not substantial. Greater differences are found in the authority to determine tax rates; the central government has exclusive power to determine the tax rate in 14 of the 37 developing countries in the sample, but the same is true for only 3 of 38 developed countries considered. In this context Peru is one of the few cases where the central government does not provide assistance in administering the property and where decision-making authority does not incentivize greater revenue autonomy.

Table 6. Main Characteristics of Municipal Tax Revenue Assignments

	Revenue shares		**Tax rates**
	Districts	**Provinces**	
District administration:			
Land and buildings	100% (5% for cadastre maintenance)	0%	< 15 UIT: 0.2% (or 15-60 UIT: 0.6%) > 60 UIT: 0.6% 1.0%
Property transfers (*alcabala*)	50%	50% (to Municipal Investment Fund)	3% (first 3 UIT exempted) (*)
Games (pinball, bingo, etc)	100%	0%	10%
Public shows	100%	0%	Bullfighting: 5% Horse racing: 10% Others: 15%
Provincial administration:			
Vehicle property	0%	100%	1% (minimum: 1.5% UIT)
Bets	40%	60%	20% (horse rising: 12%)
Games (lotteries)	0%	100%	10%

Source: Gómez, Martínez-Vázquez and Sepúlveda (2010), based on Decree Law No. 677.
Notes : (*) UIT (*Unidad Impositiva Tributaria*) or "Tributary Tax Unit" is a monetary measure used to set the value of taxes, fees, penalties and other legal payments equivalent to 3,600 nuevos soles (US$1,283 on December 31, 2010), in 2010. The value of the UIT for 2011 is the same than in 2010.

All these factors seem to be contributing to the poor tax revenue mobilization performance of Peruvian municipalities, which perform far below international standards. Table 7 shows the productivity of the property tax for a number of selected regions of the world and for Latin American countries. The OECD countries appear to be the ones taking the most advantage of this revenue source, as their ratio of property tax collections over GDP is more than 2 percent in the period 2000-2004. It is true that the property tax base can be expected to be greater in developed countries, but the productivity of the property tax in Peru, 0.17 percent of the GDP, is low even when compared to similar countries in Latin America, which on average collect almost three times as much as Peru. In the region, only Ecuador and Guatemala exhibit lower property tax performance than Peru. This low productivity might be partially explained by the tax rates applied in the country. De Cesare and Lazo Marín (2008) provide information about property tax rates in a sample of eight Latin American countries. In this group only Guatemala and Costa Rica have tax rates as low as Peru,[15] while the rest impose either higher minimum (or flat) rates (Chile, Nicaragua, Paraguay, Dominican Republic) or higher maximum rates (Bolivia).

Similar international comparisons for other own revenue sources would help to evaluate the revenue collection performance of sub-national governments in Peru, as well as identify other reasons why that performance might deviate from international standards. Unfortunately, the available information and published literature on sub-national revenue sources other than the property tax are scarce, and we are not able at this point to perform an evaluation of revenue effort and performance of other local revenue sources. In any case, we might presume that the problems found for the property tax, the most important own revenue source for sub-national governments in Peru, is at least indicative of the problems that we might find for other own revenue sources.

[15] Guatemala also has a progressive property tax schedule, with a minimum rate of 0.2 percent (the same as Peru), and a maximum rate of 0.9 percent, slightly lower than the 1.0 percent applied in Peru. In contrast, Costa Rica applies a single tax rate of 0.25 percent.

Table 7. Property Tax Collections as a Percentage of GDP, Selected Regions and Countries, 1990-2007

International averages (*)			Selected Latin American countries		
	1990-1999	**2000-2004**		**1990-1999**	**2000-2007**
All countries	0.75 (59)	1.04 (65)	Argentina	0.63	0.53
OECD countries	1.44 (16)	2.12 (18)	Bolivia	…	0.65
Transition countries	0.54 (20)	0.68 (18)	Brazil	0.32	0.43
Developing countries	0.42 (23)	0.60 (29)	Chile	0.60	0.66
Latin America	**0.36 (8)**	**0.37 (10)**	Colombia	0.36	0.50
			Ecuador	0.12	0.13
			Guatemala	0.08	0.14
			Mexico	0.18	0.18
			Paraguay	0.36	0.39
			Peru	…	**0.17**
			Uruguay	0.61	0.71

(*)Parentheses display the number of countries considered in each sample average.
Sources: Bahl and Martinez-Vazquez (2008) and ECLAC (2009).

Even though revenue collection performance is, in general, poor among local governments in Peru, there are also successful experiences in which administrative reforms have led to substantial increases in municipal revenue collections. Maybe the most notable example is the implementation of semi-autonomous offices in nine provincial municipalities.[16] Tax Administration Service offices were created by these governments with the exclusive purpose of administering and collecting tax and non-tax revenues within their jurisdictions, and thus far have provided very positive results in terms of administrative efficiency and taxpayer compliance (see Box 1). There are reasons to believe that this is not a solution that would work for all municipalities, as only few provincial (or relatively large) municipalities have

[16] The provincial municipalities are Lima, Trujillo, Piura, Huancayo, Cajamarca, Chiclayo, Ica, Tarapoto and Huamanga.

implemented the system. However, there might also be useful lessons for smaller municipalities that could be extracted from the experience.

Box 1. The Experience with Tax Administration Services in Peru

Since 1996 some Peruvian municipalities have created a semi-autonomous Tax Administration Service (SAT in Spanish). The main objective of this offices is to increase own revenues. As stated by Von Haldenwang et. al. (2009), the establishment of SAT, in its beginning was a response to the centralization that Alberto Fujimori's Government (1990-2000) pushed. However, more recent SAT creations have been implemented in a slow and still inconclusive decentralization process. While the SAT is autonomous in its financial and human resource management and it is financed through a share of the taxes and fees commissions it collects, local authorities are still responsible for regulating and controlling its work. This self-financing structure has led SATs to be more efficient in terms of revenue collection, as the more revenue they collect the higher are the sources they have. There have been some clear benefits for those Peruvian municipalities that, like Lima, Trujillo and Piura, adopted a SAT approach at the beginning. For example, those municipalities that adopted a SAT increased their own revenue by 80.9 percent, or 9 annually on average, from 1998 to 2007; by comparison, over the same period the municipalities that did not adopt a SAT saw their revenues increase by 61.2 percent, or 6.8 percent annually. Von Haldenwang et. al. (2009) show that trust in tax administration in Lima and other municipalities where an SAT was adopted has increased. This could be attributed to lower political intervention in administrative processes, higher client focus management, improved public relations, and a reduction of corrupt practices. SATs are very independent in terms of their financial and investment structure, internal organization and human resource management. But not all has been kudos for the new local tax administration. The same empirical survey studies identify several issues associated with SATs: a limited link between revenue collection and public services and the public perception of tax administration as "insensitive." But some of this is to be expected since the SATs have gone against previous conventions and taken advantage of poorly defined rules, especially in the SAT of Lima. One of the key characteristics of SAT agencies has been their drive to innovation in including internal processes, the use of modern technologies, human resource development, improved financial management, and collaboration across tax administrations.

Overall, we can conclude that, even though local governments in Peru are assigned taxing powers that are absent at the regional level, with few but important exceptions local governments have made little use of them. Thus, the intergovernmental system of finance in Peru would seem to be at an early stage of the revenue decentralization process, largely deprived of this important mechanism for increasing accountability and efficient behavior among local officials. The next section attempts to explain the performance of local governments.

3. The Determinants of Own Revenue Collections in Local Governments

Even though the overall revenue performance of local governments is poor, there are significant exceptions. It is therefore important to identify possible determinants of differences in performance and take them into account when designing proposals for reforms.

A starting point is the incentives provided by the current institutional set-up to local revenue mobilization. In this regard, the decentralization literature has given special importance to the potential effect of intergovernmental fiscal transfers on local tax effort.[17] There are several possible links between the transfer system and the problem of revenue mobilization. For sub-national governments, intergovernmental transfers might be perceived as a costless revenue source, while the costs (political and economic) of raising the same amount of revenues on their own can be quite substantial. And although all sub-national governments are likely to receive transfers, not all of them receive the same transfers or in the same amount. This implies that different revenue structures are associated with different marginal costs, and that consequently the wrong amounts of transfers can induce inefficient tax and expenditure decisions by sub-national governments (Martínez-Vázquez and Sepúlveda, 2011).[18]

In fact, the empirical literature analyzing the effect of intergovernmental transfers on own revenue collections and tax effort is quite large. In line with findings for other countries, the results for the Peruvian case are ambiguous. Based on an exploratory analysis, Rühling (2005) argues that intergovernmental transfers did not reduce property tax collections during the period 2000-2003, but he does not provide statistical evidence for that claim. Other studies using econometric analyses find a positive impact of transfers on revenue collections. Aguilar and Morales (2005) find positive but differentiated effects by department, while Melgarejo and Rabanal (2006) find a positive effect that seems to vanish when the revenues from canon and sobrecanon are included in total transfers. Contrary to these findings, Alvarado et al. (2003) and Aragón and Gayoso (2005) argue that that the total amount of transfers has reduced own revenue

[17] For a discussion see Bahl and Cyan (2010).

[18] In this respect, the literature on the flypaper effect provides evidence supporting the hypothesis that intergovernmental transfers reduce the perceived marginal costs of funds of the recipient government and consequently have a positive effect on sub-national expenditures. The flypaper effect refers to an empirical regularity by which the transfers received by the governments induce a greater expansion of public expenditures than an equal amount of transfers to individuals in the same jurisdictions. The literature about the flypaper effect is extensive; for general reviews see, for instance, Hines and Thaler (1995) and Bailey and Connolly (1998).

collections in Peru.[19] In a more recent study, Sepúlveda and Martínez-Vázquez (2011) find some evidence of substitution between the funds received from FONCOMUN and property tax collections in Peru.[20]

Although the general intuitive argument is for transfers to crowd out own local revenues, there are also a number of reasons why transfers might have a positive effect on revenue collections. For example, the funds received from transfers can be used to improve tax administration and enforcement procedures or to change the conditions that help determine tax compliance and demand for public goods. Transfers may also have the effect of helping develop the local economy and therefore improve local tax bases; thus, even if local tax effort is reduced as a consequence of the substitution effect of transfers, tax collections may go up as a result of the income or development effect of those transfers. Overall, theory is not conclusive about what the size of the final effect should be, and the empirical evidence suggests that it could go either way.

There are other factors that may affect the revenue performance of sub-national governments. In particular, administrative capacity may be an important constraint even for willing local governments. The real estate property tax, currently administered by districts, is generally difficult to administer properly; it requires both a considerable degree of sophistication and qualified personnel in its different phases of cadastre building, property assessment, billing and enforcement. On the other hand, the vehicle tax, currently administered by provinces, is generally easier to collect and requires less administrative capability. This situation suggests that a better match between administrative requirements and capabilities could be obtained by switching the vehicle tax to the district level and the property tax to the provincial level.[21]

Given the very different sizes and administrative capacity of district municipalities in Peru, we would anticipate on this ground quite different performances in revenue collections. In addition, we should expect that revenue mobilization performance of sub-national governments will be affected by their level of economic development and, of course, the size of their tax

[19] Aragón and Gayoso (2005) use FONCOMUN transfers as an instrument as they argue that the relation between transfers and revenue is guided through poverty, causing endogeneity problems; however, the design of the canon does not include a poverty component.

[20] The same authors also find evidence of the substitution effect for Brazil and for a panel of Latin American countries.

[21] We performed a simulation of the effects of switching the assignments of the two taxes between provinces and districts, which can be found in Appendix 2. Unfortunately, this measure would result in a great loss of fiscal autonomy at the district level and an intensification of current disparities at the local level.

bases. For example, urban municipalities with some concentration of industrial and service activity generally provide easier bases for raising local revenues. Finally, differentiated political and political economy factors may affect revenue mobilization performance. For all sub-national units, we may expect collection enforcement efforts to decline prior to elections. Revenue performance may also be lower in sub-national units with higher levels of local-elite capture.

3.1 What Do the Data Tell Us For the Case of Peru?

In order to identify the determinants of revenue collection performance in Peru, we use National Public Accounts data on 192 provinces and 1,630 districts for the years 2006-2008. We complete the dataset with information from the National Census 2007, the National Institute of Statistics and Information (INEI), the National Registry of Municipalities (INEI-RENAMU) and Llempén, Morón and Seminario (2010). Following the existing literature on this issue, we use total own revenue and total tax revenue in per capita terms as the dependent variables. To test the effect of transfers on revenue mobilization we use alternative measures of transfers: total transfers and the two main aggregates of local transfers in Peru, revenues from extractive industries and the FONCOMUN separately. We also run regressions for the aggregate local level and for district and provincial municipalities separately.

In order to control for the tax base of the Peruvian municipalities we consider district and provincial-level information comprising the distribution of population by age cohorts, poverty, and area; the poverty headcount index;[22] illiteracy; population; GDP per capita;[23] population working in agriculture; the employment ratio; and dummies for the region in order to capture asymmetries among regions, as argued by Aguilar and Morales (2005).[24] In addition, to capture the "explosion" of transfers over time we include a set of year and regional dummies for the period of analysis. For the actual estimation we use a set of panel data models, given their flexibility in capturing overtime behavior (many times unobservable) of the agents (municipalities). However, given that the dependent variable exhibits a high proportion of 0

[22] Contrary to previous findings we employ the poverty line headcount index as it provides a better measure of cyclical poverty. In addition, this variable provides a better measure of the purchasing power of the population. Nevertheless, the correlation of this measure with the index of Unmet Basic Needs is very high, reaching a value of 0.7.

[23] Given the lack of official measures of local GDP we use the estimates developed by Llempén, Morón and Seminario (2010).

[24] There is some correlation between some of these variables; however it does not impair the estimation other than producing underestimation of the effects. In addition, for the second set of regressions—the potential estimation—collinearity is not relevant as there we are just trying to predict values.

values this could produce biased and inconsistent estimators and, as suggested by Cameron and Trivedi (2005), a censored panel needs to be implemented. In addition, we test the same specifications excluding the 0 values and estimate a random effects panel model.[25]

As a proxy to capture administrative capacity of the municipalities we use the proportion of skilled local government workers (managerial and professional) with respect to total workers in the local government. The results for this variable indicate that municipalities with better human capital tend to perform worse in terms of revenue collection. However, the estimated coefficients are not statistically significant (see Table A1).[26] In line with the results of Aguilar and Morales (2005), we find differential effects across regions. Highly urbanized areas such as Lima and Callao present positive and significant results, while smaller regions (e.g., Piura and Pasco) show insignificant negative effects.

The controls of revenue employed behave, to some extent, as expected. Local governments with higher poverty levels (measured by the headcount index) show lower per capita revenue collection. We find a positive (yet sometimes insignificant) effect of per capita GDP, indicating that richer local governments would tend to be able to collect more revenue per capita (see Table A2). To a large extent the latter variable directly captures fiscal capacity characteristics, which help to estimate the relative size of the tax base, and indirectly captures some aspects of the administrative capacity of Peruvian local governments. Therefore municipalities with larger tax bases and better administrative capacity would be able to collect more revenues.

We also include the percentage of agricultural workers as a total of the working population to capture on one hand the degree of urbanization, and on the other hand the presence of skilled human capital in the jurisdiction. The results show a strongly negative effect, indicating that municipalities with higher levels of agricultural workers present lower levels of revenue and tax collection; these results also show the expected result that urban areas are able to mobilize higher revenues, supposedly because of better administrative capacity but also because of larger tax bases. We find a positive and significant effect of population on property tax

[25] We apply panel data Tobit estimation for the censored model, and a random effects estimator due to the inclusion of time-invariant controls in the econometric model.

[26] We also considered a dummy representing the existence of a cadastre as a proxy for administrative capacity, but the results remained insignificant. We should note that the quality of the information used to construct this variable and other institutional capacity variables is not good. Therefore the results should be interpreted with caution, since the poor quality of the data is likely to affect the consistency of the estimated coefficients.

collection, indicating the possible existence of economies of scale in collections. However, these results tend to disappear as we concentrate on the definition of the dependent variable based on own tax collections and own revenue collections.

Because of the large number of equations and estimated coefficients, in Table 8 we present only the results of the effects of per capita transfers on own revenues and own tax revenues per capita for our preferred specifications. Note that each cell in the table comes from a single and independent estimation.

The results in Table 8 show for the most part a positive relation between transfers and total own revenue collections, with the only exception, although not consistent, of FONCOMUN transfers. In contrast, the effect of total transfers on total own revenue collections is positive and robust (for all specifications) for the group of all municipalities and the subgroups of district and provincial municipalities. However, from the results obtained from separating among own tax revenues and own non-tax revenues, it would appear that the effect of total transfers on total own revenue collections is dominated by the behavior of non-tax revenues.

An increase of one nuevo sol in transfers per capita would have a positive increase on the total own revenue collection by 0.03 nuevo sol. The positive effect goes in line with the results presented by Aguilar and Morales (2005) and Melgarejo and Rabanal (2006) and discussed above. However, we do find a negative effect of transfers from the FONCOMUN on total own revenues in the Tobit estimates. The negative result for FONCOMUN transfers holds for the combined sample of districts and provinces and for districts only. These results are in line with the ones found by Sepúlveda and Martínez-Vazquez (2011). However, the coefficient for FONCOMUN transfers becomes positive for the subsample of only provincial municipalities.

As for own tax revenue collections, the results are not as strong as for total own revenues. We find a small positive effect of total transfers on own tax revenue collection in all different specifications, and a small negative although insignificant effect in the case of transfers from extractive industries. However, note that the negative and strong effect of the FONCOMUN remains present when considering Tobit estimates.

Table 8. Selected Regression Results for the Effect of Transfers on Revenue Mobilization

	Random effects estimations			Tobit estimations		
	(1) Total	(2) District	(3) Provincial	(4) Total	(5) District	(6) Provincial
Total Own Revenue Per Capita						
Total transfers per capita	0.0326***	0.0330***	0.0320***	0.0325***	0.0328***	0.0315***
	(0.0059)	(0.0071)	(0.0035)	(0.0013)	(0.0014)	(0.0032)
Extractive industries per capita	0.0327***	0.0331***	0.0321***	0.0326***	0.0331***	0.0317***
	(0.0060)	(0.0072)	(0.0035)	(0.0013)	(0.0014)	(0.0032)
FONCOMUN per capita	-0.017	-0.0562	0.1725	-0.022*	-0.0606**	0.1728**
	(0.0330)	(0.0354)	(0.1023)	(0.0123)	(0.0206)	(0.0655)
Total Tax Revenue Per Capita						
Total Transfers per Capita	0.0003	0.0002	0.0016*	0.0001	0.0001*	0.0015
	(0.0008)	(0.0010)	(0.0008)	(0.0001)	0.0000	(0.0016)
Extractive industries per Capita	-0.0004	-0.0006	0.0015*	-0.0003	-0.0004	0.0014
	(0.0005)	(0.0005)	(0.0007)	(0.0007)	(0.0008)	(0.0016)
FONCOMUN per Capita	0.0165	0.0039	0.0045	-0.0446***	-0.0649***	-0.0108**
	(0.0256)	(0.0296)	(0.0240)	(0.0107)	(0.0121)	(0.0054)
Total Non-Tax Revenue Per Capita						
Total Transfers per Capita	0.0336***	0.0350***	0.0305***	0.0335***	0.0347***	0.0300***
	(0.0064)	(0.0076)	(0.0033)	(0.0011)	(0.0012)	(0.0022)
Extractive industries per Capita	0.0340***	0.0356***	0.0308***	0.0340***	0.0354***	0.0303***
	(0.0064)	(0.0075)	(0.0032)	(0.0011)	(0.0012)	(0.0023)
FONCOMUN per Capita	-0.0034	-0.0291	0.1687	-0.0092	-0.0355*	0.1714***
	(0.0283)	(0.0309)	(0.0899)	(0.0155)	(0.0167)	(0.0474)

Notes: Standard errors in parenthesis. * 10% ** 5% ***1% significance level. Each cell represents one independent regression with a set of controls (age groups, area, poverty headcount index, population, illiteracy, population, GDP, population working in agriculture, employment ratio and dummies for region and year).

Summarizing the results, transfers from extractive industries appear to have a positive effect on the level of revenue collections, and particularly on the non-tax component of revenue collections. The causes of this relationship are not evident, but we can speculate that it might be related to a greater capacity of sub-national governments to provide public services and charge for them, with greater demand for these services, and/or with greater ability to pay on the part of the population. All of these are plausible consequences of an increase in the funds available in local jurisdictions due to additional transfers from extractive industries. In contrast, revenues from extractive industries seem to have little or no effect on municipal tax collections, as most relevant coefficients are economically and statistically insignificant.

Finally, the effect of the FONCOMUN on revenue collections is negatively statistically significant, particularly in the case of tax revenues and under the Tobit estimations. This means that the substitution effect of this source of revenues is greater than the positive income effects, and that overall the equalization transfers may be discouraging local tax collections. This is an interesting result that is in line with our expectations.

In sum, in this paper we advance on the current estimations of tax effort in Peru, not only by considering a wider range of econometric methodologies to account for potential biases, but also by distinguishing between provinces and districts, between tax and non-tax revenues, and by incorporating a wide range of control variables in the analysis. For instance, we tested different administrative capacity variables such as cadastral records by municipalities or skills of the authorities, along with several other structural variables that aim to capture the tax base of the municipalities. Although we did not find a significant effect of the administrative capacity proxies that we use, we did find significant effects of variables that aim to capture tax base, such as GDP or poverty. Overall, we do not have a very strong story to tell on the impact of transfers on the general poor performance in revenue mobilization of Peru's municipalities, but we believe that future research might gain much by incorporating into the analysis better proxies for administrative capacity and other variables such as institutional development, tax morale and corruption.

4. The Municipal Compensation Fund and Other Transfers to Local Governments

The discussion in the preceding section suggests that, in order to understand municipal governments' tax collection behavior, it is necessary to examine the transfers local governments receive from both FONCOMUN and extractive industries.

The Municipal Compensation Fund (FONCOMUN) is a conventional equalization transfer program, established in 1994 by Legislative Decree No. 776 (Law of Municipal Taxation). The FONCOMUN is financed with the municipal promotion tax (*impuesto de promoción municipal*), which consists of a rate of up to 2 percent applied over the value added tax, plus other minor revenue sources. According to the 1994 Law, the distribution of the FONCOMUN should be based on equity and compensation criteria, and the transfer should ensure the functioning of all municipalities. More recently, Law 29332 of 2009 and Supreme Decree 060-2010 introduced "managerial performance" as an additional criterion in the distribution formula.

Box 2 summarizes the procedure currently used to distribute the available FONCOMUN funds among municipalities. In the first stage, the transfer fund is allocated to the provinces in proportion to their unmet basic needs weighted by their population. In the second stage, provinces keep 20 percent of the funds. The remaining 80 percent is distributed among the each province's district governments in accordance with three factors: population, managerial performance, and land area. The most important of these factors is population, with a weight of 85 percent, where rural population is assumed to have twice the expenditure needs of urban population. The next factor in importance is managerial performance, which is defined in terms of the rate growth of per capita own revenue collections and the share of transfers from FONCOMUN that is spent on capital expenditures. In the final stage, the amounts of transfers are adjusted so that all municipalities receive at least a minimum transfer equivalent to eight monthly UITs.[27]

[27] The UIT is a legal monetary unit whose value has been set to 3,600 nuevos soles since 2010 (US$1,283 at December 31, 2010)

Box 2. The Distribution of the FONCOMUN

Stage 1: geographical distribution to province *j*:

$$\frac{Pop_j \times UBN_j}{\sum_{i=1}^{N} Pop_i \times UBN_i} \times FUND$$

Stage 2: distribution to municipalities:

20% → Provincial Municipality

80% → District Municipalities:

$0.85 \times$ [Urban Pop + $2 \times$ Rural Pop]
+ $0.10 \times$ [managerial performance]
+ $0.05 \times$ [size in km^2]

Stage 3: adjustments to ensure a minimum transfer of 8 (monthly) UITs to each municipality

Source: Based on SD 156-2004 and SD 060-2010.

The FONCOMUN is an important component of municipal revenues in Peru in terms of its relative magnitude as well as its compensating function. However, certain aspects of its design can still be improved. A first criticism is that the system considers a certain approximation of expenditure needs but does not offer any adjustment due to fiscal capacity of municipal governments. Consequently, under the current system all municipalities, even those that already have abundant fiscal resources, receive transfers of a certain amount. Those resources could have a much more equalizing effect if they were used to support those municipalities with low fiscal capacity. The same argument serves to identify a second criticism of the current distribution procedure. If some municipalities already have sufficient fiscal capacity to finance their expenditure needs, then the minimum transfer they receive could be used with a greater equalizing effect if those funds could be allocated to municipalities with lower fiscal capacity. A third criticism is that allocation in two stages, first to the province and later to the districts, can result in undesirable changes in the final allocations to the districts. To see this, think about two identical districts that belong to different provinces; depending on the provinces' characteristics they will likely receive different per capita transfers even though their expenditure needs and fiscal capacity are the same.

The absolute size of the revenues that municipalities receive from extractive industries and the equalization transfer program is significantly greater than at the regional level. The total amount of revenues received from extractive industries by municipalities during 2008 was 5,145 million nuevos soles, more than three times the revenues regional governments received from the same source (1,669 millions nuevos soles). Similarly, the transfers allocated by the municipal equalization transfer program, the FONCOMUN, reached 3,257 million nuevos soles during the same year, an amount almost five times larger than the funds distributed by the FONCOR at the regional level. Moreover, together these two revenue sources represented 63.7 percent of total municipal government expenditures, compared to only 18.8 percent of total regional expenditures.

Accordingly, we can expect the distortions imposed by the canon and other revenues from extractive industries to be larger at the local level. By the same token, the equalizing power of the FONCOMUN also can become a more critical policy issue at the local level. Tables 9 and 10 present basic statistics describing the cross-section variability of these revenue sources across provincial and district municipalities, respectively. Both the coefficient of variation and the range of transfer amounts over the average show that in 2004 the variability of the revenues from extractive industries was already much larger than the variability of FONCOMUN transfers. Note also the remarkable explosion in revenues from extractive industries and their variability in 2008. By comparison, transfers from the FONCOMUN appear to be less variable. From Table 9, we can see that the maximum per capita transfers received by a province in 2008 from extractive industries (Lucumba) was 25 times greater than the maximum per capita transfers from the FONCOMUN (the province of Lamud). This ratio reaches a value of 17 when comparing maximum transfers to districts, with Ilabaya receiving the greatest amount from extractive industries and San Jose de Ushua receiving the greatest amount from FONCOMUN.

As we reviewed for FONCOR above, in the case of regional governments the equalizing power of the FONCOMUN for provinces and municipalities is compromised by several factors. First, the canon and other revenues from extractive industries are comparable to, or larger in magnitude than, those from the FONCOMUN. Second, FONCOMUN allocation criteria do not consider relative fiscal capacity, while the allocation of the canon does not consider expenditure needs. Note that the correlation coefficient between the two revenue sources in 2008 is zero or very close to zero for provinces and districts, which implies that the allocation of the canon and

other revenues from extractive industries are in practice independent from the expenditure needs at the provincial level (as approximated by the FONCOMUN).

Table 9. Variability of Provincial Revenues from Extractive Industries and FONCOMUN, 2004 and 2008 (in nuevos soles per capita)

	2004		2008	
	Extractive industries	**FONCOMUN**	**Extractive industries**	**FONCOMUN**
Minimum	0.0	22.7	0.0	44.7
Maximum (province)	1,265.6 (Purús)	1,037.5 (Iñapari)	24,072.6 (Lucumba)	954.7 (Lamud)
simple average	51.3	161.3	397.6	260.1
weighted average	8.3	25.7	44.5	46.6
standard deviation	128.0	116.3	1,762.2	152.9
coefficient of variation (*)	15.3	4.5	39.6	3.3
(max - min)/average	151.6	39.5	541.5	19.5
Correlation (extractive inds and FONCOMUN):	0.12		0.00	

(*) The coefficient of variation is defined as the standard deviation divided by the weighted average.
Source: Authors' calculations based on MEF data.

Besides the transfers from extractive industries and the FONCOMUN, there are several transfers from the central government to municipalities, which in 2008 represented 11 percent of current municipal revenues (see Table 5). The most important of these transfers is the Glass of Milk (*Vaso de Leche*) program, which stands for around 3 percent of current municipal revenues. This program targets to poor households with high nutritional needs, particularly pregnant or breastfeeding women, newborns and the elderly. Glass of Milk is a classic example of a conditional transfer program aimed to reach national objectives and administered entirely by the local governments. According to Stifel and Alderman (2003), the program has been successful in targeting poor households and fulfilling their nutrition needs.

Table 10. Variability of District Revenues from Extractive Industries and FONCOMUN, 2004 and 2008 (in nuevos soles per capita)

	2004		2008	
	Extractive industries	**FONCOMUN**	**Extractive industries**	**FONCOMUN**
Minimum	0.0	0.0	0.0	7.4
Maximum	2,383.6	1,662.6	29,003.5	1,691.9
(district)	(Lobitos)	(Curibaya)	(Ilabaya)	(San Jose de Ushua)
simple average	57.3	165.0	423.2	198.2
weighted average	17.4	37.3	134.1	66.4
standard deviation	129.1	167.0	1,257.0	154.5
coefficient of variation (*)	7.4	4.5	9.4	2.3
(max - min)/average	137.0	44.5	216.2	25.4
Correlation (extractive inds and FONCOMUN):	0.09		0.02	

(*) The coefficient of variation is defined as the standard deviation divided by the weighted average.
Source: Authors' calculations based on MEF data.

Other transfers of less importance include local governments' share of customs duties collected by SUNAT, and certain transfer programs designed to support capital expenditures. Local governments' share of customs duties, which represented 1.3 percent of current municipal revenues in 2008, are justified as a means to finance local development initiatives and are distributed among jurisdictions with customs offices according to population and land area. On the other hand, capital transfers represent around 2 percent of current municipal revenues and include programs for the promotion of public investment, for social infrastructure and for construction of roads and streets.

5. Correcting Fiscal Incentives through the Computation of Fiscal Capacity

Under an optimal assignment of revenue sources, all government units should face the same marginal costs of public funds (Dahlby and Wilson, 1994). Correcting the marginal costs faced by sub-national governments is one of the most important roles of intergovernmental equalization transfers. Actually, if the objective of equalization transfers is restated as the equalization of marginal costs of providing a standard bundle of public services, then a transfer program designed to equalize fiscal disparities becomes a powerful tool to simultaneously reach the objectives of efficiency and equity in a decentralized system of government (Martínez-Vázquez and Sepulveda, 2011).

As we have seen, there are currently two equalization transfer programs in place in Peru; FONCOR at the regional level and FONCOMUN at the local level. Their equalizing effect, however, is significantly limited by the presence of other transfers in the form of the canon and other revenues from extractive industries. For these reasons it is quite likely that the intergovernmental system is facing high efficiency and equity costs. The distortionary effects of the canon and other revenues from extractive industries have been widely recognized as a problem that needs to be addressed in the future reforms in Peru. For example, a recent document by USAID/Peru (*Pro-Descentralización*, 2010b) examines the opinion of relevant players in the decentralization process in order to identify the 16 most important priorities for future reform, and among them we can find issues involving inequalities caused by the current system of intergovernmental transfers.[28]

The ideal way to solve the problems created by the canon and other revenues from extractive industries would be to change the distribution criteria and, specifically, to eliminate the derivation principle from the revenue sharing scheme. However, it appears that it will not be politically feasible any time soon to make major reforms to the distribution criteria of revenues from extractive industries, as the current system has created a strong sense of entitlement in which the winners are not willing to give up their benefits. In this context, one possible strategy to address the problems of equity and efficiency from the canon is to attempt to neutralize its effects by incorporating measures of fiscal capacity that account for all revenue sources (other

[28] Also mentioned is the need for reconsidering the assignment of expenditure responsibilities. However, the survey does not provide specific proposals to improve the current system.

than equalization transfers) into the formulas used in the equalization transfer programs (FONCOMUN and FONCOR). At the very least, this type of reform would allow the system to start reducing the exiting inequities and distortions before direct reforms to the laws on the canon, sobrecanon and royalties can actually be implemented.

In this section we present several alternative methodologies for measuring fiscal capacity, and we illustrate their use by estimating the fiscal capacity of local governments in Peru. The approaches are assessed in terms of their possible accuracy and the feasibility of their prompt implementation.

5.1 The Estimation of Own Revenue Potential and Fiscal Capacity

Revenue potential or fiscal capacity can roughly be defined as the amount of revenues that a government would be able to raise under standard conditions of tax administration capacity and fiscal effort. The key aspect of this definition is the consideration of equal conditions in terms of administrative capacity and effort. By establishing common standards for all governments, we can conceptually distinguish what we might call a "fair" estimation of the amount of revenues they can potentially collect, from the amount of revenues they actually collect in practice. Many sub-national governments, especially in developing countries like Peru, commonly lack the technology, the technical ability or simply the financial recourses to administer and enforce the payment of taxes or the fees and charges from public services, and it would not be reasonable to expect that they would collect as much tax from their bases as others would. In contrast, other jurisdictions with the ability to collect abundant resources might voluntarily choose not to do so; in this case it would not be desirable to assume that they need financial or technical assistance.

To better understand the relationship between actual (or observed) revenues and potential revenues, let us use this definition:

$$\textit{Actual Revenues} = (\textit{Revenue Potential} + \textit{Administration Adjusts.}) \times \textit{Fiscal Effort Adjusts}. \quad (1)$$

where administration and fiscal effort adjustments are applicable to any source of own revenues in which sub-national governments have discretion over the amount of collections either because they can change policy parameters (for example, tax rates) or tax administration (for example, enforcement effort).

The measure of revenue potential—and more precisely the measure of *own* revenue potential—becomes operational when used in the distribution formula of an equalization transfer

program. An equalization transfer program can be targeted to the reduction of horizontal disparities in expenditure needs and/or horizontal disparities in fiscal capacity. The international experience is rather mixed, but whenever expenditure needs and fiscal capacity are expected to be unevenly distributed across sub-national governments it is advisable to address both sources of imbalances. In such a case, the distribution of equalization transfers can be based on the measure of fiscal disparity, simply defined as:

$$\textit{Fiscal Disparity} = \textit{Expenditure Needs} - \textit{Fiscal Capacity} \quad (2)$$

Sub-national governments with positive fiscal disparity require additional funds to cover their expenditure needs, but sub-national governments with negative fiscal disparity do not require additional funds, at least according to the standards with respect to which expenditures needs and fiscal capacity have been defined.[29] In order to obtain the required estimation of fiscal capacity we need to focus exclusively on the revenue potential of those sources for which the sub-national government can exert some degree of discretion either by policy or administration choices. All other sources of revenues can be considered exogenous, with potential revenues being equal to actual revenues. The measure of fiscal capacity therefore could be written as:

$$\textit{Fiscal Capacity} = \textit{Own Revenue Potential} + \textit{Transfers Received other than Equalization} \quad (3)$$

In this way the fiscal capacity measure summarizes all sources of funds, discretional and exogenous, that a sub-national government can use in order to cover its expenditure needs. Note that if equalization transfers are distributed according to equations (2) and (3), then, other things equal, sub-national governments receiving more revenues from extractive industries would receive fewer equalization transfers.[30] Therefore, by incorporating the measure of fiscal capacity in the distribution formula of an equalization transfer program, we can at least partially counterbalance the effects of the canon and other revenues from extractive industries.[31]

[29] Boex and Martínez-Vázquez (2007) provide a review of international practices in the choice of equalization criteria, as well as detailed explanations of alternative methodologies for estimating expenditure needs and fiscal capacity.

[30] In many countries sub-national governments have quite limited tax autonomy, and the bulk of their revenues is derived from sharing in national taxes or other forms of transfers. This is especially true for regional governments in Peru, but it is also a common phenomenon in most less developed and transitional countries around the world. In some of these cases fiscal capacity can be safely measured by the actual or forecast level of shared revenues and transfers.

[31] This principle holds even if part of the revenues from extractive industries is correctly justified as compensation for environmental costs. In that case greater environmental costs can easily be incorporated into the estimations of the expenditure needs of jurisdictions where resource extraction takes place. See Gómez, Martínez-Vázquez and

There are several possible methodologies that can be used to estimate sub-national fiscal capacity. In the following discussion we will implement three of them, which we have selected because of their applicability to the current conditions of data availability in Peru. In what follows we discuss the three methodologies; they are presented in order from the simplest and least data-intensive to the most complex and demanding in terms of information.

Methodology 1: Multi-year lagged averages of relative own revenue collections per capita

This methodology has minimum data requirements because it is based only on historical data about own revenue collections. The disadvantage of using historical data is that it can plausibly create perverse incentives by inducing sub-national authorities to collect fewer taxes in order to receive more (costless) transfers in the future. This methodology, as developed in Martínez-Vázquez and Zekate (2002), has been designed to minimize those incentives given that historical data need to be used.

The first step consists of computing the ratio of actual own revenues per capita of each jurisdiction to average own revenues per capita for all jurisdictions of the same level during a certain year. The next step consists of computing this measure of relative per capita collections for several (maybe three or five) past years and obtaining their average. The final step is to multiply the ratio of average per capita collections to the national average by the aggregate per capita revenue forecast for the entire group of sub-national governments to yield the estimated tax collection potential per inhabitant for each sub-national unit.

Although the approach may be effective in reducing perverse incentives to sub-national fiscal behavior associated with the use of historical data, the results still need to be interpreted with caution as the approach does not identify or correct for differences across governments in administrative capacity or fiscal effort. Relative per capita collections might well be perpetuating severe horizontal disparities that cannot be corrected through this methodology. For this reason estimations of fiscal capacity based on multi-year averages of relative revenue collections are advisable only when there are no additional quality data available to improve these estimates.

Sepúlveda (2009a, 2009b) for more extensive discussions about the design and implementation of equalization transfer programs and applications for Peru.

Methodology 2: Basic proxies for the ability to pay and collect taxes

A different approach to the estimation of potential own revenues consists of using variables that could credibly serve as indirect measures of sub-national tax bases. The obvious advantages of this approach are that no perverse incentives are provided to sub-national authorities[32] and that measures are not subject to errors related to the perpetuation of historical disparities in sub-national revenue potential. It is difficult, however, to find a variable that accurately describes the ability of governments to collect taxes. Common examples of these variables are personal income and gross domestic product inside the jurisdiction, but accurate measures of these variables are rarely available in developing countries. Even if they do exist, they would not necessarily provide an accurate portrayal of the absolute or relative size of sub-national tax bases.

Methodology 3: Regression-based representative revenue system

The representative revenue system was first developed by the U.S. Advisory Commission on Intergovernmental Relations (1986), and its objective is to estimate the amount of revenues a government would collect from the available tax bases if it exerts an average level of fiscal effort. This methodology requires data on (or estimates of) sub-national tax bases, and it usually interprets average fiscal effort as the average level of effective tax rates applied across the national territory.

Absent any estimates of the tax bases faced by sub-national governments in Peru, here we develop a simple variation of this methodology that uses regressions similar to the ones presented in the previous section. These regressions, presented in columns (1) and (5) of Table A2 (Appendix 1), include the same factors we have used to explain sub-national revenue performance, excluding intergovernmental transfers. The predicted value obtained with these regressions can be interpreted as potential revenue collections because they are obtained by considering the variables used to estimate the size of the tax base and other factors representing administrative capacity.

[32] As long as the proxies used cannot be modified by sub-national governments.

5.2 An Application to Municipal Governments in Peru

The three methodologies for estimating revenue potential are applied separately to provincial and district governments. Since provincial governments have additional expenditure responsibilities and revenue assignments, they can be expected to face different fiscal conditions. Similarly, we distinguish in the estimation between tax revenue collections and other own revenue sources like fees and user charges, because collections of these two sources of revenue are not necessarily determined by the same factors.

A few clarifications about the implementation of the methodologies are in order. All methodologies have been carried out as if the last available data were from 2008, and actual figures of revenue collections of 2009 have been assumed to correspond to (accurate) aggregate revenue forecasts.

The first methodology, based on multi-year averages of relative own revenue collections per capita, uses data from three-year periods corresponding to 2006-2008. The second methodology, based on basic proxies for the ability to pay and collect taxes, uses estimates of the gross domestic product GDP for all Peruvian districts, which have been developed by Llempén, Morón and Seminario (2010).

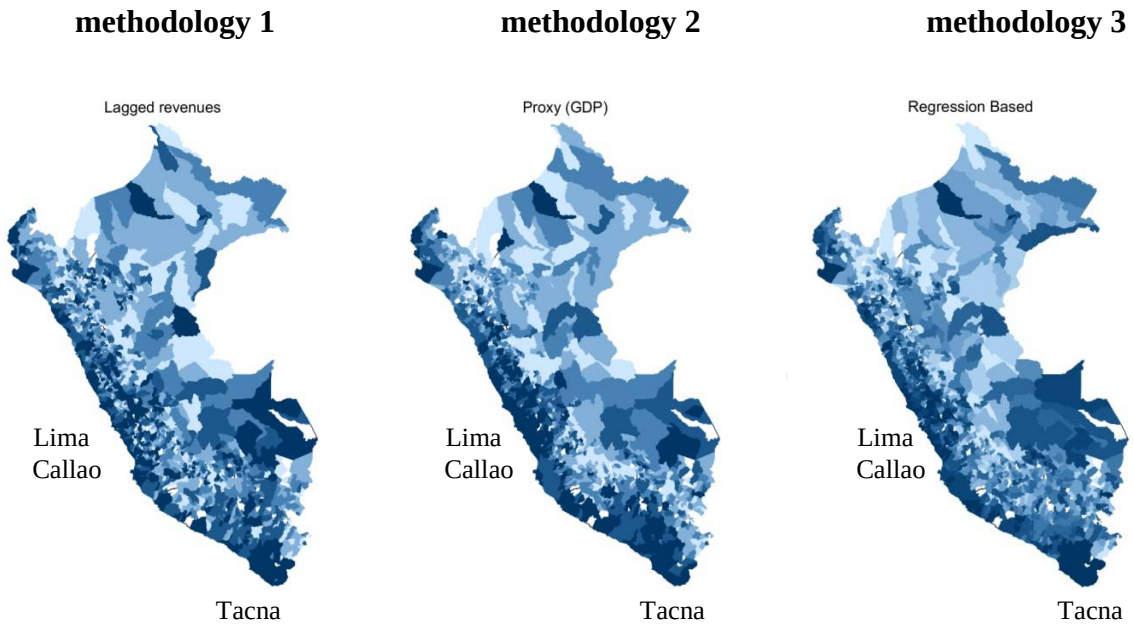
The third methodology, based on the representative revenue system, leads in some cases to negative values for potential revenue collections.[33] This is not a plausible result, and it is the consequence of the poor explanatory power of our regression, which in turn is explained by omitted variable bias. There are important determinants of revenue collection, such as administrative capacity, institutional development and taxpayers' compliance behavior, among others, that we could not control for because there are no available measures for them in Peru.

To provide a general idea of the results obtained under the three methodologies we map the results in Figure 1. The methodologies are represented in order from left to right, and greater estimates of per capita fiscal disparity are represented by darker colors. As we can expect, the first methodology provides estimates that seem to closely match actual revenue collections, but this is not surprising given the use of historical data to arrive at those estimates. While some differences in results may be expected when using different methodologies, we can identify some common patterns. For instance, districts in the provinces of Lima and Callao appear as having

[33] The estimations of potential revenue collections are based on the results of the regression analysis presented in Section 3. The coefficients used are those corresponding to GDP per capita, poverty, percentages of population by age groups, area, percentage of agricultural workers and dummies for regions and years.

relatively high own revenue potential. The region of Tacna (in the south) also displays high revenue potential, perhaps reflecting spillover effects generated by trade with neighboring countries.

Figure 1. Tax Capacity at the Local Level



Source: Authors' estimations.
Notes: Darker areas represent municipalities with higher tax capacity. The first graph shows the results from the average lagged revenues approach. The second graph shows the results from using a proxy (GDP) approach. The third graph shows the results from the regression-based representative revenue system approach.

Among the three methodologies, we argue that the regression-based representative revenue system is the ideal option, because it permits estimating own revenue potential while properly controlling for other factors that explain the difference between potential and actual revenues. It is not applicable to municipal governments in Peru in the short run, however, because important variables that need to be considered are not yet available. In order to implement this methodology it would be desirable first to develop good measures of administrative and technical capacity, institutional development, and other variables that might be helpful in explaining actual revenue collections, like corruption among government officials, tax morale and community demand for local public services. Such variables are difficult to develop, particularly at the local level, but reasonably good proxies might be found.

While the regression-based representative revenue system estimates are being improved, less desirable but currently feasible methodologies might be implemented. The results from the first and second methodologies are also presented here as examples of possible alternatives. Tables 11 and 12 present basic statistics on the distribution of actual and potential revenues as well as revenues from FONCOMUN for the provincial level and district level, respectively. The distribution and variability of the three series of revenue potential estimates, and of course especially for the first methodology, are similar to those of actual revenues. Especially relevant is the fact that the application of all three methodologies for the group of districts, either based directly on actual revenues or on a different variable like the GDP, are uncorrelated with the FONCOMUN. This suggests that the FONCOMUN is not currently compensating those districts with lower fiscal capacity.

Table 11. Basic Statistics for Actual and Potential Own Revenues Per Capita of Provinces (in nuevos soles)

	Actual own revenues	method 1	method 2	method 3	FONCOMUN
Minimum	4.1	4.0	32.3	0.0	46.9
Maximum	2,503.6	2,557.9	1,202.6	996.7	1,067.0
Average	107.0	110.3	190.6	119.9	288.7
Standard deviation	218.9	217.3	142.5	122.1	174.5
Coefficient of variation	2.0	2.0	0.7	1.0	0.6
(max - min)/average	23.4	23.2	6.1	8.3	3.5
Correlation with actual own revenues	1.00	0.99	0.26	0.68	0.03
Correlation with FONCOMUN	0.03	0.01	-0.19	-0.22	1.00

Sources: MEF and authors' estimations.

The FONCOMUN performs better among provinces in terms of the equalization of fiscal conditions. Its correlation with methodologies 2 and 3 is -0.19 and -0.22, respectively, which suggests that the criteria for distributing the equalization fund across provinces (unmet basic needs) might be capturing certain aspects of relative fiscal capacity.

Table 12. Basic Statistics for Actual and Potential Own Revenues Per Capita of Districts (in nuevos soles)

	Actual own revenues	method 1	method 2	method 3	FONCOMUN
Minimum	0.0	0.0	6.8	0.0	7.7
Maximum	2,857.0	3,454.8	4,013.3	607.9	1,861.1
Average	53.9	60.8	75.2	44.5	219.4
Standard deviation	176.5	199.5	172.9	63.7	177.3
Coefficient of variation	3.3	3.3	2.3	1.4	0.8
(max - min)/average	53.0	56.8	53.3	13.7	8.4
Correlation with actual own revenues	1.00	0.97	0.25	0.50	-0.02
Correlation with FONCOMUN	-0.02	0.01	0.06	-0.02	1.00

Sources: MEF and authors' estimations.

5.3 Fiscal Effort: Actual versus Potential Revenues in Peruvian Municipalities

While we acknowledge that limited data availability does not allow for the perfect estimation of fiscal capacity with the regression-based representative revenue system, we argue that this is conceptually the most appropriate methodology, and that future work could be devoted to developing the variables required for this methodology to perform correctly. Here we use the own revenue potential estimations obtained under this methodology to perform a preliminary analysis of fiscal effort among local governments in Peru.

Following equation (1) we can define relative fiscal effort as the ratio of actual own revenues over own revenue potential (adjusted by administrative capacity).[34] For a measure of

[34] Dividing the two sides of equation 1 by *Revenue Potential + Administration Adjustments* (due to differences in administrative capacity) we obtain:

$$\frac{Actual\ Revenues}{Potential\ Revenues + Administration\ Adjustments} = Fiscal\ Effort$$

fiscal effort greater (lower) than one, the government would be exerting relatively more (less) fiscal effort than the average level of effort. Again, due to data limitations it is not possible to obtain unbiased estimations of fiscal effort. Therefore our results should be interpreted with caution and considered only as preliminary illustrations of local fiscal effort estimates for Peruvian municipalities.[35]

In Figure 2 we show the relation between potential and actual tax and other own (non-tax) revenues for provincial and district governments in Peru. Actual revenues are measured in the vertical axis and potential revenues in the horizontal axis, thus those municipalities lying above (below) the 45 degree line have collections greater (lower) than their potential.

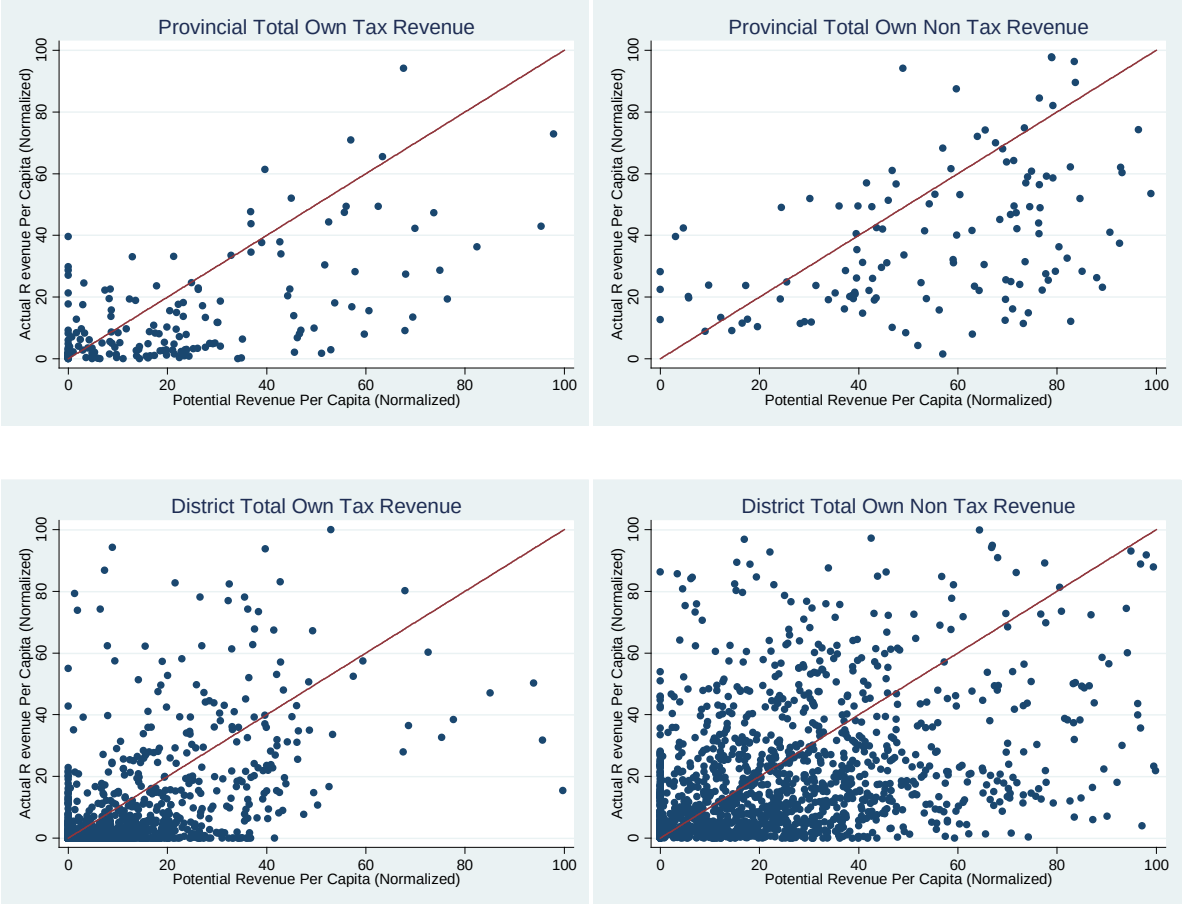
The four graphs suggest that Peruvian municipalities exert very different levels of fiscal effort, and there seems to be no clear pattern among municipalities of the same type or collections from similar sources. The differences in the distances with respect to the origin inform about the disparities in actual tax collections and/or revenue potential, and the high concentration of municipalities close to the origin, as is the case with provincial taxes and both revenue sources at the district level, suggests that many municipalities actually collect few taxes because their revenue potential is also very poor.

On the other hand, the distances from the 45 degree line could plausibly be explained by the limited explanatory power of our estimates. For instance, there are significant differences between the actual and potential revenues in some areas around Metropolitan Lima and business districts like Arequipa. Municipalities with high tax bases due to their economic activity (i.e., Lima, Miraflores, San Isidro, San Juan de Lurigancho, Callao, etc) appear as collecting much more own tax revenue than their potential, while municipalities with smaller tax bases (i.e., Rimac, Villa Maria del Triunfo, Comas, etc.) collect far less than what their estimated tax revenue potential. The rural areas show similar results but with smaller differences between actual and potential revenue. In general, similar patterns are also observed for non-tax revenue collections.[36]

[35] The omitted bias problem might be especially relevant in Peru, where administration capacity is irregularly distributed among governments of the same level.

[36] We also carried out a regression analysis in order to find the determinants of fiscal effort among Peruvian municipalities, but the analysis showed no significant results. We interpret that this outcome might be caused by the aforementioned data limitations and possible biases in our revenue potential estimates.

Figure 2. Provincial and District Distributions of Fiscal Effort



Source: Authors' estimations.

6. Exploring Alternative Sources for Regional Revenue Autonomy

One of the most relevant problems with the current assignment of revenue sources to sub-national governments in Peru is the absence of revenue autonomy at the regional level. In fact, as we have seen, regional governments have not been assigned their own tax instruments. Thus, one important issue that needs to be addressed is what tax sources can be assigned to the intermediate level of government in the Peru context. The issue is explored in this section.

In general, the assignment of tax instruments to the intermediate levels of government faces several difficulties. While economies of scale in tax administration and possible coordination problems usually make it advisable to keep the administration of many productive tax revenue sources at the central level, the gains from revenue decentralization are often greater

at the local level, where proximity to taxpayers facilitates fulfillment of the benefit principle in taxation. The greater proximity of local governments in some cases could also help to reduce costs of administration, enforcement and compliance and help increase accountability.[37]

Difficulties in finding own tax revenue sources for intermediate level governments, however, do not reduce the importance of own revenues for promoting fiscal autonomy and accountability for regional governments. A common approach to fostering fiscal autonomy at the intermediate levels of government is to allow the cohabitation of tax bases with the central government, as in the cases of piggyback personal income taxes, and cohabitation in some cases with local tax bases, as in the case of the property tax. Other times, some exclusive basis may be found, such as assignment of a payroll tax at the regional level.[38]

An even more common practice is defining revenue-sharing schemes on a derivation basis, as a fixed proportion of central government tax collections from one or several tax instruments in the jurisdiction.[39] These schemes may allow regional governments to enjoy productive and buoyant revenue sources without assuming the administrative and political costs of collecting taxes. For these reasons revenue sharing schemes are understandably a very attractive revenue source for those authorities in the benefited areas, but they also have important limitations.

One limitation is that "fixed" revenue-sharing schemes do not allow regional authorities to alter the amount of revenues received. As a consequence, they have no fiscal autonomy on the margin and are not perceived by taxpayers as responsible for marginal changes in the budget, which in practice may reduce their accountability and constituents' incentives to participate in regional decisions. A good solution is to allow for "flexible" revenue sharing schemes by in fact converting the revenue sharing into a piggyback tax, where tax rates can be altered within a range by the regional authorities. Piggyback schemes have been effective in a number of developed and developing countries: Nordic European countries, the United States, Spain, Japan, and several Eastern European countries.[40]

[37] For a review of tax administration issues at the sub-national level see Martínez-Vázquez and Timofeev (2010).
[38] But even here the tax base is in cohabitation with social security taxes.
[39] Another approach, fairly common in Latin American countries, is to define the revenue-sharing scheme as a fixed proportion of central government tax collections, and then to distribute the available funds among regional governments in accordance with certain equalizing criteria. In many case, this arrangement is in reality a funding mechanism for an equalization transfer fund or some other form of transfer, an aspect of the system of sub-national finances that is not discussed further in this paper.
[40] For further discussion see Bird, Ebel and Wallich (1995), Rao (2007) and Martínez-Vázquez (2008).

Another limitation of revenue-sharing schemes on a derivation basis is that they normally create additional horizontal inequalities due to the uneven distribution of tax bases across the national territory. However, this is a problem fully shared with options creating revenue autonomy. For this reason the implementation of new revenue autonomy or revenue-sharing schemes on a derivation basis needs to be accompanied by additional funds to the equalization transfer program in place or, if possible, improvements in its equalizing power via a change in the distribution formula. Below we explore in greater depth several potential alternatives for improving regional tax autonomy and accountability.

6.1 Options for Cohabitation with Central Government Tax Bases

In the first place, we must make it clear that some important central government tax bases might not be very suitable for introducing piggyback or even revenue-sharing schemes on a derivation basis with regional governments. This is the case, for example, of the corporate income tax (CIT), customs taxes, or even the VAT and most excises. But before we explore what some of the options may be, it is important to review the geographical distribution of central tax collections.

SUNAT is responsible for administering and collecting the largest and most buoyant taxes in Peru. Table 13 shows the main central government tax collections by region in 2008. Domestic taxes represent 71 percent of total tax collections, and more than 84 percent of these taxes are collected in Metropolitan Lima. There are few regions contributing with more than 1 percent of domestic tax collections. Besides Callao, which provides around 5 percent of domestic taxes, only Piura contributes more than 2 percent, while Cusco and La Libertad each provide 1.4 percent. A similar pattern is observed in each of the two main aggregates of domestic taxes, the income tax and the taxes on production and consumption.

Table 13. SUNAT's Tax Revenue Collections by Region (2008) (in thousands of nuevos soles and as percent of total)

	Income taxes	%	Taxes on production and consumption	%	Domestic taxes	%	Taxes on international trade (*)	%
Amazonas	10,747	0.0	1,107	0.0	14,915	0.0	0	0.0
Ancash	135,131	0.6	76,933	0.4	237,986	0.5	209,507	1.2
Apurimac	9,044	0.0	5,233	0.0	17,916	0.0	0	0.0
Arequipa	40,856	0.2	28,200	0.2	76,012	0.2	21,473	0.1
Ayacucho	1,363	0.0	839	0.0	2,555	0.0	0	0.0
Cajamarca	67,702	0.3	51,997	0.3	135,317	0.3	0	0.0
Callao	944,449	4.2	1,344,756	7.4	2,471,194	5.5	15,795,190	86.8
Cusco	467,352	2.1	113,837	0.6	618,551	1.4	371	0.0
Huancavelica	4,569	0.0	8,011	0.0	13,727	0.0	0	0.0
Huanuco	22,043	0.1	4,857	0.0	31,766	0.1	0	0.0
Ica	145,641	0.6	151,440	0.8	324,269	0.7	634,891	3.5
Junín	142,436	0.6	80,505	0.4	263,554	0.6	0	0.0
La Libertad	287,556	1.3	271,813	1.5	635,781	1.4	159,326	0.9
Lambayeque	109,758	0.5	106,258	0.6	242,194	0.5	6,232	0.0
Lima	54,436	0.2	69,945	0.4	146,368	0.3	0	0.0
Loreto	120,266	0.5	37,618	0.2	180,944	0.4	109,267	0.6
Madre De Dios	21,807	0.1	5,070	0.0	30,745	0.1	2,373	0.0
Moquegua	22,109	0.1	20,805	0.1	47,717	0.1	174,782	1.0
Pasco	18,463	0.1	16,182	0.1	37,984	0.1	0	0.0
Piura	454,860	2.0	462,640	2.5	976,325	2.2	350,981	1.9
Puno	43,413	0.2	30,615	0.2	87,292	0.2	102,637	0.6
San Martin	48,114	0.2	23,652	0.1	81,793	0.2	567	0.0
Tacna	62,828	0.3	45,386	0.2	122,804	0.3	559,902	3.1
Tumbes	12,958	0.1	10,769	0.1	29,081	0.1	58,277	0.3
Ucayali	59,786	0.3	134,627	0.7	208,121	0.5	1,037	0.0
Total Regions	3,307,688	14.6	3,103,094	17.0	7,034,912	15.6	18,186,814	100.0
Lima Metro.	19,400,081	85.4	15,131,327	83.0	38,048,935	84.4	0	0.0
Total by source	22,707,770	100.0	18,234,421	100.0	45,083,847	100.0	18,186,814	100.0
Share on total		35.9	28.8			71.3		28.7

(*) Include import duties, VAT, excises and other less relevant taxes.
Source: SUNAT.

The concentration of tax collections is explained by the location of large taxpayers and the level of economic activity. For instance, almost 90 percent of collections from the corporate income tax (which stands for 66 percent of income tax collections in 2008), comes from large taxpayers located in Lima. On the other hand, taxes on international trade are also very concentrated, but this time in Callao, given the location of the Customs Office, with 87 percent of tax collections, and in other regions with ports and customs like Ica and Tacna.[41]

The concentration of tax revenue collections in Metropolitan Lima and Callao suggest that the tax bases in the regions might not be able to provide significant resources through piggybacking on central taxes or even revenue-sharing schemes. In addition, some regions contribute small or even negligible amounts to tax collections, implying that there are notable differences in the size of tax bases across regions.

The usefulness of regional tax bases for possible own revenue sources can better be assessed by considering the size of the budget under regional government control. In Table 14 we present regional collections for the main central government taxes and, for comparative purposes, the main regional revenue sources as shares of regional expenditures. Transfers of ordinary resources are by far the main revenue source for regional governments, while revenues from extractive industries represent significant shares of expenditures only in certain regions; others regions seem to be partially compensated by the funds received from the FONCOR.

Note that several regional governments receive more transfers in the form of ordinary resources than the total amount of domestic taxes the central government is able to collect in their region.[42] In other words, several regions might not have the tax bases required to finance their actual spending levels (at the prevailing tax rates) and therefore would necessarily depend on net subsidies from the center in order to perform in accordance with the current spending standards.[43] Although of less interest to us, note that it seems that no central government revenue source could provide, through a derivation-based revenue sharing scheme, significant revenues to all regional governments.

[41] The taxes on international trade consist of import duties (representing 10 percent of taxes on international trade during 2008), VAT (85 percent), excises (4 percent) and other minor taxes.
[42] The exceptions are Callao, Cusco, Ica, La Libertad, Lambayeque, Piura, Tacna, Ucayali, and Metropolitan Lima.
[43] It is worth noting that this is a situation also experienced in many other countries around the world, and explains the relevance, in Peru and many other countries, of intergovernmental equalization transfers.

Table 14. Regional and Central Government Revenues as Shares of Regional Expenditures, 2008 (in percent)

	Regional revenues				Central government tax collections			
	FONCOR	Extractive industries	Ordinary resources (excluding FONCOR)	Other regional revenues	Domestic taxes			Taxes on international trade (*)
					On Income	On prod. and cons.	Total	
Amazonas	13.8	0.0	67.3	31.6	3.5	0.4	4.9	0.0
Ancash	1.4	36.8	66.4	53.6	17.6	10.0	31.0	27.3
Apurimac	15.2	1.6	77.0	11.2	2.5	1.5	5.0	0.0
Arequipa	4.9	14.8	70.4	28.3	5.0	3.5	9.4	2.7
Ayacucho	7.7	5.5	81.0	14.0	0.3	0.2	0.5	0.0
Cajamarca	1.2	9.4	72.2	10.9	9.0	6.9	18.0	0.0
Callao	0.3	0.3	49.2	42.7	234.6	334.1	614.0	3,924.3
Cusco	1.1	28.2	58.8	12.2	54.0	13.1	71.4	0.0
Huancavelica	14.1	8.5	70.0	10.5	1.2	2.1	3.5	0.0
Huanuco	10.4	0.6	79.6	18.0	5.4	1.2	7.8	0.0
Ica	2.6	0.9	84.8	8.4	34.5	35.8	76.7	150.2
Junín	4.3	5.3	84.2	13.8	20.6	11.6	38.1	0.0
La Libertad	5.1	8.2	73.0	18.4	33.0	31.2	72.9	18.3
Lambayeque	4.8	0.0	84.4	30.4	21.1	20.4	46.6	1.2
Lima	3.8	11.1	74.4	13.3	9.3	11.9	24.9	0.0
Loreto	0.9	25.5	62.0	13.4	16.7	5.2	25.2	15.2
Madre De Dios	10.0	0.1	76.0	35.6	17.2	4.0	24.2	1.9
Moquegua	2.1	32.2	47.3	21.9	9.6	9.0	20.7	75.9
Pasco	5.4	1.9	54.0	14.5	7.1	6.3	14.7	0.0
Piura	5.2	12.7	72.0	24.9	58.4	59.4	125.3	45.0
Puno	5.7	7.7	82.0	11.3	6.2	4.4	12.4	14.6
San Martin	12.4	0.0	60.7	18.2	8.3	4.1	14.0	0.1
Tacna	1.8	55.1	49.0	15.8	18.2	13.1	35.6	162.1
Tumbes	5.1	14.1	79.0	9.9	6.4	5.3	14.3	28.6
Ucayali	5.4	20.0	63.5	30.6	18.2	41.0	63.4	0.3
Regional average	5.1	12.9	70.3	20.4	25.6	24.0	54.5	140.8
Lima Metro.	2.0	0.6	3.7	123.9	2,677.4	2,088.3	5,251.1	0.0
National average	4.9	12.2	66.7	25.9	166.5	133.7	330.5	133.3

(*) Include import duties, VAT, excises and other less relevant taxes.
Sources: SUNAT, DNCP, MEF.

The relatively small share of tax revenue collections over regional expenditures is to some extent the result of the high level of noncompliance observed in the most important tax instruments used by the central government. Tax evasion is an important source of tax collection erosion in countries with a low or medium level of development, where incentives to escape the burden of taxation are high and the enforcement mechanisms are weak. This is the case of Peru, where tax compliance seems to perform below international standards.[44] In a recent study, Arias (2010) estimated the tax evasion rates of the most important groups of central government taxes for 2006. Tax evasion was estimated at 32.6 percent of potential personal income tax revenue collections and 51.3 percent of potential corporate income tax revenue collections. These estimates suggest that tax collections in Peru are far below their potential, and therefore that reforms in areas such as tax administration and tax collection might lead to significantly greater collections nationally and from each region. Unfortunately, however, there is no information about how tax evasion affects tax collections by region, and thus it is difficult to arrive at precise estimates of potential regional revenues for possible cohabitation of central and regional governments in the same tax bases. Besides the problem of tax compliance, another major factor in reducing revenue collections is the existence of several tax expenditure programs. These can be defined as spending programs implicitly implemented through the tax system. They consist of tax credits, deductions, exemptions and other preferential treatment arrangements that benefit certain groups of individuals or firms. Tax expenditures might be a simple, politically feasible and even efficient way to direct resources in the economy, but they could also introduce significant complexity into the system and might not be as easy to adjust and target as other transfer programs. SUNAT (2009) estimated the tax expenditures for the year 2010 at 2.13 percent of GDP. Indirect taxes, mainly the VAT, are the main source of tax expenditures in Peru, representing 1.86 of GDP.[45] A great deal of the tax expenditures carried out through the VAT are related with exemptions for basic services in the agricultural and fishing sector; but in general

[44] Tax evasion is also a pervasive problem in other Latin American countries. Alm and Martínez-Vázquez (2007) provide information about the size of the shadow economy in several countries and regions around the world. Given that the size of the shadow economy increases with tax evasion, this variable reports the magnitude of the problem of noncompliance in a country. The average size of the shadow economy reported for Latin America is 41 percent of Gross National Product (GNP), with the maximum value found in Bolivia (67 percent of GNP) and the minimum in Chile (20 percent of GNP). The size of the shadow economy in Peru is relatively large, representing 60 percent of GNP.

[45] The VAT (also known as the General Sales Tax) represent 73 percent of total tax expenditures estimated for 2010, while tariffs represent 9 percent and excise taxes 5 percent.

VAT tax expenditures seem to be driven by redistributive objectives. Indeed, more than 40 percent of the benefits are directed to Amazonian regions, characterized by relatively small population but high poverty rates.[46] Direct taxes explain a much smaller, although still relevant, proportion of tax expenditures. Tax expenditures from the personal income tax are estimated at 0.16 percent of GDP, and those from the corporate income tax at 0.12 percent of GDP.

Considering both the available estimates of tax evasion and estimates of tax expenditures, it seems reasonable to expect that revenue collections will increase with future improvements to the system. In this sense, it is important to consider that the potential gains in revenue autonomy associated with a reform providing regional governments with new revenue sources may likely increase if such an initiative is accompanied by nationwide reforms in the tax system aimed at improving compliance for the main tax instruments.

Table 15 presents the same regional and central government revenue sources in per capita terms. The data on per capita revenues can be used to compare the observed productivity of tax bases across regions, which are shown to be very uneven. In Ayacucho, for instance, the central government collects only 4 nuevos soles per inhabitant, and in six other regions (Amazonas, Apurimac, Arequipa, Cajamarca, Huancavelica, Huanuco) per capita revenues do not exceed 100 nuevos soles. In contrast, Callao, Ica, Moquegua, Tacna and Metrpolitan Lima contribute revenues far above 1,000 nuevos soles per capita.

The correlation between regional revenues per capita, particularly from the FONCOR, and per capita collections by the central government shows how alternative autonomous revenue sources or even revenue-sharing schemes might intensify or counterbalance existing regional inequalities. Given that the distribution of the FONCOR is implicitly based on estimates of fiscal disparities, then other revenue sources displaying a positive (negative) correlation with the FONCOR may be said to have a positive (negative) equalizing potential effect at the regional level. The only revenue sources displaying a positive correlation with the FONCOR are the historically based and gap-filling transfers known as “ordinary resources” and other regional revenues, from which we may conclude that the central government is, at least to some extent, implementing (if not explicitly considering) equalization criteria while financing regional expenditures through these two sources. Note, as also discussed above, that the revenues from extractive industries seem to have the effect of aggravating existing fiscal disparities.

[46] The Amazonia regions are Loreto, Amazonas, Cajamarca, Madre de Dios, San Martin and Ucayali.

Table 15. Regional Revenues and SUNAT's Tax Revenue Collections per Capita by Region, 2008 (in nuevos soles per capita)

	Regional revenues				Central government's tax collections			
	FONCOR	Extractive industries	Ordinary resources (excluding FONCOR)	Other regional revenues	Domestic taxes			Taxes on inter-national trade (*)
					On Income	On prod. and cons.	Total	
Amazonas	112	0	549	257	29	3	40	0
Ancash	10	266	479	386	127	72	224	197
Apurimac	135	15	685	99	22	13	44	0
Arequipa	34	104	494	199	35	24	66	19
Ayacucho	61	44	643	111	2	1	4	0
Cajamarca	6	51	391	59	49	37	98	0
Callao	1	1	226	196	1,077	1,534	2,818	18,013
Cusco	8	209	435	90	399	97	528	0
Huancavelica	120	73	598	89	10	18	30	0
Huanuco	56	3	427	96	29	6	42	0
Ica	15	6	503	50	205	213	455	892
Junín	24	30	473	78	116	65	214	0
La Libertad	27	44	393	99	178	168	393	99
Lambayeque	22	0	394	142	99	95	218	6
Lima	26	77	520	93	65	83	174	0
Loreto	7	206	499	108	135	42	203	123
Madre De Dios	116	1	880	412	199	46	281	22
Moquegua	30	460	674	312	137	129	295	1,082
Pasco	50	18	498	134	66	58	135	0
Piura	24	59	335	116	271	276	582	209
Puno	32	43	455	63	34	24	69	81
San Martin	99	0	485	145	66	32	112	1
Tacna	22	659	586	189	218	157	425	1,939
Tumbes	52	144	805	101	65	54	145	291
Ucayali	41	152	482	232	138	312	482	2
Total Regions	33	84	458	133	167	157	355	918
Lima Metro.	2	1	4	118	2,551	1,989	5,003	0
National average	25	61	332	129	828	665	1,644	663
Correlation coefficients (exclude Lima Metro.)								
FONCOR	1.00	-0.31	0.59	0.17	-0.39	-0.33	-0.36	-0.26
Extractive industries		1.00	0.20	0.31	0.03	-0.06	-0.02	-0.04
Ordinary resources (excluding FONCOR)			1.00	0.34	-0.45	-0.48	-0.47	-0.40
Other regional revenues				1.00	0.13	0.10	0.12	0.11

(*) Include import duties, VAT, excises and other less relevant taxes.
Sources: SUNAT, DNCP, MEF.

The territorial analysis of central government tax collections leads to two somewhat discouraging conclusions about the revenue potential of piggyback taxes or even possible revenue sharing schemes. First, new regional taxes cohabitating central tax bases would be able to provide significant funds to only a few regional governments. Second, such a policy move

would introduce additional fiscal disparities. The latter problem can be handled by additional strengthening of the regional equalization scheme, the FONCOR, incorporating additional funds currently transferred to regional governments through other programs (e.g., ordinary resources). But ultimately, what needs to be weighted is the gain from greater fiscal autonomy and accountability for regional governments, even if little revenue can be raised in many regions.

Several tax instruments offer the possibility of being assigned to the regional governments, and choosing the most appropriate way to do so requires weighing several advantages and disadvantages.[47] The most effective alternative for increasing revenue autonomy and accountability at the regional level is to provide regional governments a piggyback personal income tax with discretion to set a flat rate within certain ranges. This would be a residence-based tax, since taxpayers usually benefit most from public services in the region where they live. In that sense, this piggyback personal income tax can be expected to roughly satisfy the benefit principle of taxation. The additional advantage is that this is one of the most visible taxes, even when collected via withholding, and therefore taxpayers are more likely to notice any tax rate increase by the regional government and increase the accountability of government authorities.

The Single Revised Text of the Income Tax Law (approved by Supreme Decree No. 179 of 2004) establishes five categories of taxable income. Besides the corporate income tax, which corresponds to the third category, the law defines four categories of taxable income for individuals. The first and second categories encompass capital income in the form of rents from property leases and returns on financial investments, respectively. It could be argued that these types of personal income are not necessarily generated in the region where a taxpayer lives, and thus they would not adequately fulfill the benefit principle. Alternatively, however, horizontal and vertical equity considerations may call for the use of capital income taxes, as they allow distributing tax burdens progressively across income levels. Therefore, capital income may or may not be included in the tax base of the regional personal income tax. A clearer case can be made for the inclusion of professional income and the tax on wages, which correspond to the fourth and fifth categories, respectively of the Income Tax Law. These taxes simultaneously satisfy the benefit principle and equity considerations, and at the same time they increase the accountability of regional authorities. Unfortunately, it is also very likely that a more intense use

[47] See, for example, Ter-Minassian (1997), McLure (1998), Bird (2000) and Martinez- Vazquez (2008).

of these taxes might exacerbate the problem of labor informality already encountered in Peru; therefore their use at the regional level should also be accompanied by measures that incentivize tax compliance and reduce the push toward informality.

An additional question that needs to be considered is the regional scope of the piggyback personal income tax. Given the particular characteristics of the Constitutional Province of Callao and Metropolitan Lima, it is possible to make a case for treating them separately. These two jurisdictions do not lack own revenue collections at present, and providing them with the regional personal income tax would exacerbate existing fiscal disparities to a degree that a reformed FONCOR may not be able to address. On the other hand, discriminating against regions that are doing economically better can send the wrong message and incentives, and it would work against the principles of decentralization and sub-national autonomy.

Table 16. Tax Collections from Fourth and Fifth Categories of Personal Income Tax by Region (2008)

	Total tax collections (thousands of nuevos soles)			Share on regional expenditures (%)			Tax collections per capita (nuevos soles)		
	4th categ.	5th categ.	sum	4th categ.	5th categ.	sum	4th categ.	5th categ.	Sum
Amazonas	615	1,283	1,898	0.2	0.4	0.6	2	3	5
Ancash	4,227	22,012	26,239	0.6	2.9	3.4	4	21	25
Apurimac	575	1,151	1,726	0.2	0.3	0.5	1	3	4
Arequipa	667	12,755	13,422	0.1	1.6	1.7	1	11	12
Ayacucho	93	217	310	0.0	0.0	0.1	0	0	1
Cajamarca	1,981	8,399	10,381	0.3	1.1	1.4	1	6	7
Cusco	4,892	49,829	54,722	0.6	5.8	6.3	4	43	47
Huancavelica	812	872	1,683	0.2	0.2	0.4	2	2	4
Huanuco	1,256	2,710	3,966	0.3	0.7	1.0	2	4	5
Ica	3,376	32,008	35,384	0.8	7.6	8.4	5	45	50
Junín	3,242	16,771	20,013	0.5	2.4	2.9	3	14	16
La Libertad	7,634	58,968	66,602	0.9	6.8	7.6	5	36	41
Lambayeque	3,479	12,513	15,992	0.7	2.4	3.1	3	11	14
Lima	3,059	7,559	10,618	0.5	1.3	1.8	4	9	13
Loreto	3,681	14,496	18,177	0.5	2.0	2.5	4	16	20
Madre De Dios	609	1,379	1,989	0.5	1.1	1.6	6	13	18
Moquegua	959	4,569	5,528	0.4	2.0	2.4	6	28	34
Pasco	996	1,421	2,416	0.4	0.5	0.9	4	5	9
Piura	7,146	48,225	55,371	0.9	6.2	7.1	4	29	33
Puno	1,290	6,820	8,110	0.2	1.0	1.2	1	5	6
San Martin	1,301	5,461	6,762	0.2	0.9	1.2	2	7	9
Tacna	1,800	7,902	9,702	0.5	2.3	2.8	6	27	34
Tumbes	564	1,778	2,342	0.3	0.9	1.1	3	9	12
Ucayali	1,368	6,349	7,717	0.4	1.9	2.4	3	15	18
Total regions (excl. Callao and Metro. Lima)	55,623	325,448	381,071	0.4	2.6	3.0	3	17	20
correlations:									
FONCOR							-0.33	-0.54	-0.53
Extractive industries							0.56	0.39	0.42

Source: SUNAT.

For illustration purposes, Table 16 shows personal income tax revenues for the 24 regions from the fourth and fifth categories of the Income Tax Law. As expected, total and per capita tax collections vary quite considerably across regions, and collections do not represent a significant share of expenditures. Even if the regional government were given all collections from the fourth and fifth categories, on average they would be able to finance only 3 percent of their total outlays. The limited benefit of this outcome is that the introduction of this tax at the regional level, after the central government creates the necessary fiscal space, would not significantly alter central authorities' control of macroeconomic policy.

As discussed above, the implementation of a piggyback personal income tax (based on the fourth and fifth categories) would inevitably create new horizontal imbalances at the regional level,[48] and an appropriate policy response is likely to involve increasing the proportion of transfers distributed with the goal of equalization. Given FONCOR's limited resources, a natural response would be to consider redirecting the large amount of funds currently transferred as "ordinary resources," which are distributed in accordance with historical spending patterns arising from regional expenditure assignments. It is not entirely clear at present whether "ordinary resources" are correcting or perpetuating existing fiscal disparities among regional governments, although we have seen some evidence above that their distribution may be to some degree equalizing. Nonetheless, redirecting "ordinary resources" toward a new unconditional equalization transfer program or a reformed and reinforced FONCOR would not only help address fiscal disparities but also rationalize and make more transparent the budgeting of these resources. Note also that some of the "ordinary resources" could be allocated to a conditional grant program to help finance "merit" functions such as education and health. These topics, however, lie beyond the scope of the present paper.

Although less attractive as regional revenues sources, several central government taxes may still be considered as possible options for piggybacking schemes. In Table 17 we present four such taxes and provide information on the amount of collections to briefly evaluate some of their main advantages and disadvantages. The personal income tax (PIT) on capital income, which comprises the first and second categories of the Peruvian income tax, represents a very small proportion of revenues in the 24 regions considered, but this is partially explained by the

[48] See the correlation coefficients in Table 16, which are relatively high and with negative sign when measured with respect to the FONCOR, and positive sign when measured with respect to extractive industries' revenues.

fact that neither interests nor capital gains are currently subject to taxation. In contrast, the corporate income tax (CIT) and the VAT represent on average more than 11 percent of regional expenditures, and they could thus plausibly become important sources of revenue autonomy for regional governments. A very particular situation is observed for the excise taxes (referred to as selective taxes on consumption), which are virtually negligible for most regions but an important revenue source in Ucayali. The four revenue sources display a negative correlation with FONCOR, suggesting that their use for regional government financing would, in principle, exacerbate current fiscal disparities.

The practical limitations of these tax instruments in the context of regional revenue mobilization are numerous and diverse. First, revenues from the PIT on capital income are small and likely unrelated with benefits from sub-national services. Geographical apportionment formulas can be used for the PIT on capital income as well as for the CIT, but these procedures are rather arbitrary and lead to imprecise estimates, as the U.S. case makes clear. The VAT is shared with sub-national governments in a number of countries using formulas based on population or regional GDP, but these are not solutions for increasing revenue autonomy. Regional VATs exist in a much reduced number of countries (e.g., Canada, Brazil), but this would certainly be a very complicated alternative for Peru. Excise tax bases can provide some options if there is the administrative technology to implement differentiated regional rates, but this is generally difficult.

All in all, given the still poor tax administration and tax collection capacity observed in Peru, the use of the cohabitation of regional and central governments in bases like PIT on capital income, the CIT, the VAT and special excise taxes on production and consumption might not be advisable at the present time. However, future improvements to the system may help to increase collections to more significant amounts, reduce distortions due to noncompliance, and address the administrative complexities related with heterogeneous tax policies across regions.

Table 16. Tax Collections by Region of Alternative (Less Desirable) Revenue Sources, 2008

	Share of regional expenditures (%)				Tax collections per capita (nuevos soles)			
	PIT on capital (1st+2nd categories)	CIT (3d categ.)	VAT	Excises	PIT on capital (1st+2nd categories)	CIT (3d categ.)	VAT	Excises
Amazonas	0.2	2.0	0.4	0.0	1	16	3	0
Ancash	0.5	10.8	10.0	0.0	3	78	72	0
Apurimac	0.2	1.6	1.4	0.0	1	14	13	0
Arequipa	0.2	2.9	3.4	0.1	1	21	24	1
Ayacucho	0.0	0.2	0.2	0.0	0	1	1	0
Cajamarca	0.5	5.6	6.9	0.0	2	30	37	0
Cusco	1.2	41.4	13.1	0.0	9	306	97	0
Huancavelica	0.1	0.6	2.1	0.0	0	5	18	0
Huanuco	0.4	3.2	1.2	0.0	2	17	6	0
Ica	1.4	15.8	34.6	1.2	8	94	205	7
Junín	0.8	14.3	11.6	0.0	5	80	65	0
La Libertad	1.6	15.7	29.7	1.4	9	85	160	8
Lambayeque	1.6	12.9	20.1	0.3	7	60	94	1
Lima	0.7	3.8	11.6	0.4	5	27	81	2
Loreto	0.7	9.7	4.1	1.2	6	78	33	9
Madre De Dios	0.8	9.0	3.9	0.1	10	104	45	1
Moquegua	0.9	4.3	9.0	0.0	12	61	128	0
Pasco	0.2	3.0	6.2	0.0	1	27	58	0
Piura	0.9	40.3	59.3	0.1	4	187	276	0
Puno	0.3	3.4	4.2	0.1	2	19	24	1
San Martin	0.3	4.1	4.1	0.0	3	33	32	0
Tacna	1.1	11.3	12.7	0.4	13	136	152	5
Tumbes	0.5	3.3	5.3	0.0	5	33	54	0
Ucayali	0.7	11.2	9.9	31.1	5	85	75	236
Total regions (excl. Callao and Metro. Lima)	0.7	11.4	12.6	1.1	5	78	86	7
correlations:								
FONCOR					-0.36	-0.42	-0.48	-0.06
Extractive industries					0.63	0.34	0.28	0.07

Source: SUNAT.

6.2 Options for Cohabitation with Local Government Tax Bases

Piggyback taxes and revenue-sharing arrangements for intermediate levels of government are usually thought of as being based on taxes administered by the central government. We have shown, however, that this alternative is likely to provide limited resources to regional governments in Peru. So it might be desirable to look for other alternatives. One option that may be worth exploring is cohabitation by regional governments of some of the tax bases that have been assigned to municipal governments.

Taxpayers paying local taxes are most likely receiving benefits from regional services as well. Thus, if there is an identifiable link to benefit from services in some of the municipal taxes,

as in the case of the real estate property tax or the real estate transfer tax, this link may be extendable to services provided by regional governments. The arguments previously developed about citizens' participation and accountability of regional authorities could be equally valid for some of those municipal taxes.

However, any cohabitation of bases or even revenue-sharing schemes involving local taxes might affect municipalities' already scant incentives to collect their own taxes. There would also be vertical fiscal externalities where the decisions of one level of government would affect the revenue possibilities of another level.[49] In this case, allowing regional governments a substantial degree of discretion in setting their own rates—even within a certain range—might not be desirable given the current fragility and small size of local tax bases. A potentially different angle in this case is that regional governments may be interested in a fixed revenue-sharing scheme if they are allowed to become involved with tax revenue collection efforts within their borders (for example, by developing the fiscal cadastre of real estate properties).

Although several local taxes could, in principle, be considered for the purpose of financing part of regional expenditures, only taxes on immovable properties have the potential to provide any significant additional revenues. Table 18 shows local collections from taxes on production and consumption and from property taxes. Taxes on production and consumption consist of provincial or district taxes on games, public shows and gambling, but on average tax collections add up only to 4 nuevos soles (2 without considering Lima), and they are equivalent to less than 1 percent of regional expenditures. The tax on vehicle property has so far provided a negligible amount of tax revenues. Even though there may be some potential for this tax base in the future, including at the regional level, we will not look into this possibility any further at this point because we lack the necessary data.

[49] These vertical externalities are also present in the case of cohabitation or sharing between the central and regional governments, of course, but their significance may be quite larger in the case of municipal governments.

Table 17. Local Tax Revenue Collections by Region (2008)

	Share on regional expenditures (%)					Tax collection per capita (in nuevos soles)				
	Production and consumption	Property taxes				Production and consumption	Property taxes			
		vehicle	transfer	property	total		vehicle	transfer	property	Total
Amazonas	0.1	0.0	0.1	0.5	0.6	1	0	1	4	5
Ancash	0.1	0.1	0.4	2.1	2.6	1	1	3	15	19
Apurimac	0.0	0.0	0.1	0.3	0.5	0	0	1	3	4
Arequipa	0.5	0.4	1.5	3.5	5.4	3	3	11	24	38
Ayacucho	0.0	0.0	0.1	0.7	0.8	0	0	1	6	7
Cajamarca	0.1	0.2	0.4	1.1	1.7	1	1	2	6	9
Callao	0.4	0.5	3.4	8.0	11.9	2	2	16	37	55
Cusco	0.1	0.1	0.7	1.4	2.3	1	1	6	10	17
Huancavelica	0.0	0.0	0.0	0.5	0.6	0	0	0	4	5
Huanuco	0.1	0.0	0.3	0.7	1.0	1	0	1	4	5
Ica	0.5	0.1	1.4	3.8	5.3	3	0	8	22	31
Junín	1.0	0.2	0.5	2.7	3.5	6	1	3	15	19
La Libertad	0.3	0.2	1.5	3.7	5.4	2	1	8	20	29
Lambayeque	0.5	0.2	1.1	3.1	4.3	2	1	5	15	20
Lima	15.3	13.3	57.1	61.5	131.9	11	9	40	43	92
Loreto	0.2	0.0	0.2	0.8	1.0	2	0	1	7	8
Madre de Dios	0.2	0.0	0.2	1.4	1.6	2	0	2	16	18
Moquegua	0.2	0.4	0.6	1.7	2.6	3	5	9	24	38
Pasco	0.1	0.0	0.1	0.8	0.9	0	0	1	7	8
Piura	0.3	0.1	1.1	2.7	3.9	1	1	5	13	18
Puno	0.1	0.1	0.1	1.3	1.5	0	0	1	7	8
San Martin	0.1	0.0	0.3	1.0	1.3	1	0	2	8	10
Tacna	0.5	0.2	0.5	2.1	2.7	6	2	5	25	32
Tumbes	0.2	0.0	0.2	1.2	1.5	2	0	2	13	15
Ucayali	0.1	0.0	0.3	0.9	1.3	1	0	2	7	10
National average	0.9	0.7	3.3	4.8	8.7	4	3	15	22	41
Average without Lima	0.2	0.1	0.7	2.0	2.8	2	1	5	13	19

Source: MEF.

From Table 18 we can see that, for 2008, revenue collections from the property tax on land and buildings and the tax on property transfers represent 2.7 percent of regional expenditures. This is a rather small amount, but this proportion could be expected to increase significantly, even double or treble, with proper improvements in the administration of those taxes. In this context, there are several scenarios including an added fixed rate for regional governments, which would contribute at least 1 percent of the aggregate regional budget. This is a rather minor on average, but in some regions the additional revenues might still become effective in enhancing fiscal autonomy and accountability in the margin, and possibly also facilitating regional authorities to get more involved and interested in local efforts to increase tax collections.

6.3 Options for New Regional Taxes

This is a difficult area, where it is as important to avoid poor choices of highly distortionary taxes as it is to find what new taxes may be a good fit for providing revenue autonomy to regional governments.

Some forms of business taxes or business license fees may provide regional governments with an administratively easy way to tax the income of businesses that benefit from public services and infrastructure. This should be conceived of as broad-based levies on general business activity falling equally on labor/payroll and capital (assets) used by businesses.[50] Maybe the best example of a well-designed regional business tax is Italy's IRAP (*Imposta Regionale sulle Activita Produttive*).The base of the IRAP is basically the same as that of the typical VAT, computed as the difference between sales revenues and the sum of all purchases and depreciation. The IRAP is, therefore, an origin-based type of VAT. The rate applied by the central government is 4.25 percent, and regions are allowed to increase or decrease this rate by 1 percent. The revenues are distributed among regions in proportion to the labor costs estimated for each region (and the tax rates applied).[51] Another possibility is Chile's *patente municipal*. This annual levy is paid on any commercial activity (trade, professional, industrial, and sale of alcoholic beverages) that requires a permanent office location.[52]

Another possible new tax revenue source for regional governments is the excise tax on public utility services, such as electricity and phone services. Besides revenue potential and relative administrative ease, these taxes may be attractive because of their link to the benefit principle; compared to other commodities, taxation of public utilities is associated with relatively low distortions because of relatively low price-elasticity of demand. In any case, they should be used with caution, as they could discourage the consumption of goods and services with positive externalities. In addition, while setting taxes on electricity consumptions one needs to weigh carefully the burden they impose on production costs for energy-intensive industries, and the resultant loss of competitiveness. Appendix 3 presents an estimate of potential regional tax collections from a tax on residential consumption of electricity. A tax imposed only on

[50] For example, Bird (2003) discusses the business value tax (BVT) which is origin-based, and its base is calculated by adding payroll, interest, rents, and net profits on the basis of annual accounts.

[51] Keen (2003) offers a detailed discussion of the IRAP in the context of the Italian tax reform of 2003.

[52] Chile's municipalities select rates between 0.25 and 0.5 percent that fall on the declared (to national tax administration) own capital of the business. The revenue potential is not insignificant. In Chile the *patente municipal* raises approximately the same amount of municipal revenues in Chile as the property tax (*impuesto territorial*).

residential consumption of electricity would avoid the creation of economic distortions, although our estimates suggest that it would not serve as a significant source of regional revenues.

Green taxes, also known as environmental taxes and sometimes as pollution taxes, may offer an innovative and potentially significant source of revenues for regional governments in Peru (Gómez, Martínez-Vázquez and Sepúlveda, 2010). These taxes are an application of the "polluter pays" principle, by which those responsible for negative environmental externalities should also provide the resources required to correct the damage done to the environment and/or compensate those suffering losses due to that damage. There is a great variety of possible green taxes, and they have widely been applied in both developed and developing countries around the world.[53] Examples of green taxes are those applied to air pollutants like carbon dioxide (CO_2), sulfur dioxide (SO_2), nitrogen dioxide and fuels; to transport in the form of car sales and the road tax; to waste; and to different products such as tires, beverage containers, plastic bags, and batteries, among others.

The implementation of green taxes in Peru has already been considered by the Congress, which in January 2010 received a draft law on environmental taxation. In line with international practice, the initiative considered taxes on contaminants like sulfur dioxide and carbon dioxide, the polluting components of fuels, polluting factors of production and polluting consumption goods. The draft law opens the door for the creation of sub-national green taxes and assigns sub-national governments (at the regional and local levels) the authority to establish new environmental fees. Of course, if this or a similar version of the law is finally passed in Congress some regional governments may gain a great deal of fiscal autonomy. Still, its implementation should proceed with prudence, as green taxes also have also some important drawbacks. The main potential problems with taxes of this type are that they might disincentivize productive activities and, the same as the revenues from extractive industries, they could increase fiscal disparities due to the uneven distribution of potential tax base. Because of this reasons regional green taxes should be subject to central some controls and regulations, and preferably accompanied with an increase in regional equalization transfers.

[53] Speck et al. (2005) provide an overview of the use of green taxes in European countries.

6.4 A Comparative Evaluation of Possible New Sources of Regional Own Tax Revenues

In this section we have considered a great variety of possible tax revenue sources for regional governments. In the following discussion we provide a comparative evaluation of these alternatives based on what the literature considers the most desirable characteristics of a tax instrument. Table 19 shows the performance we might expect from each tax instrument under each desirable characteristic. We consider 10 alternative tax instruments, four of which correspond to taxes assigned to the central government, two assigned to the local governments, and four new tax instruments that could be created for the regional governments. The expected performance of the tax instruments under each criterion is initially rated as high (H), medium (M) or low (L). These rates are meant to be only preliminary indicators of the performance that we expect to find for the alternative tax instruments under each criterion; more accurate measures would require exhaustive analyses that go far beyond the scope of this paper.

The first criterion considered to evaluate the alternative tax instruments is revenue potential, which attempt to capture the relative size of the tax bases and their room to grow under ideal conditions. As we have seen, most taxes seem to have relatively small tax bases in the country's regions, but tax collections could be expected to increase with improvements in tax administration, tax enforcement and taxpayer compliance. In particular, the VAT (or general sales tax in Peru) and a version of the IRAP could be expected to provide very broad bases and great potential for increasing tax revenues.

The revenue adequacy criterion summarizes how relevant the tax revenue sources would be in the context of the regional budgets. It is difficult to address this issue because the relevancy of revenue sources depends on actual behavior of a number of undetermined variables, such as the rates at which the regional government would be able to tax each base. In general, the cohabitation of tax bases with other levels of government should impose a limit on the rate the regional government would be able to apply, while the tax instruments that we are considering as exclusive for regional governments may not provide large amounts of revenues for all regional governments.

Revenue buoyancy and tax elasticity of the tax base are similar concepts. The first is defined here as the change of the tax base with respect to economic growth or economic activity, and the second refers to the change of the tax base with respect to the tax rate. All tax bases can be expected to grow with economic growth, but differences should be observed as greater wealth

is transferred to individuals, used to increase the consumption of some goods and capitalized, for instance, in the prices of properties. The second concept, tax elasticity, depends on taxpayers' ability to evade payment. Some tax bases are more mobile, like those applied to capital and corporations, and others are difficult to avoid and evade, like those applied to individual property or the production and consumption of necessities. Overall, the personal income tax on capital and the corporate income tax are not recommendable as sub-national tax instruments.

The correspondence between who pays a tax and its beneficiaries refers to the extent to which the benefit principle of taxation is fulfilled. Only collections from the personal income tax and the property tax can be expected to remain in the area where taxpayers enjoy the resulting public goods, and therefore only those taxes can generally be considered efficient and fair in terms of this criterion. The same might be true, but to a lesser extent, for general consumption taxes (VAT and IRAP) or taxes on electricity and phones, but this criterion is usually not satisfied by taxes on individual investments on capital or properties and the CIT.

The economic literature identifies the distortionary effects taxation with the changes that it imposes on relative prices, which in turn can alter the location choices of individuals and firms as well as labor supply and other behavioral decisions. Maybe the most distortionary tax instruments among the alternatives considered is the CIT. This tax would distort the location and production decisions of firms, which will likely alter relative prices of goods and services in the national economy. The distortionary effects of other taxes are uncertain, but they can be expected to be less significant. In this case it is relevant to consider whether tax instruments fulfill the benefit principle, because adjustments in relative prices can be interpreted as efficient if they are correlated with the benefits from public goods provision.

Administrative costs are particularly high for the property tax, and by extension the tax on property transfers, whose implementation requires properties to be appropriately valued. Other taxes may be simpler to administer as long as they are applied over relatively few and easy to identify corporations or sellers. In Table 19 we suggest that the administration costs of the personal income tax may remain at a medium level, for which we assume that its administration would remain largely centralized. Other important costs to be considered are those assumed by the taxpayers while complying with the tax system. Complex procedures are usually related with greater compliance costs, and when individual taxpayers are involved in the determination of tax burden (as in the PIT and property tax) it is not possible to take advantage of economies of scale.

If supervision and control mechanisms are absent, taxpayers and tax officials may attempt to capture part of the public funds. It is difficult to predict whether regional tax administration would introduce or reduce the opportunities for corruption, but given the still-low level of development of tax administration in the country and the incipient tax culture observed outside the main urban centers, it seems reasonable to consider corruption a potentially relevant problem for all the alternative tax instruments. In particular, the property tax (and thus also the tax on property transfers) might offer additional opportunities for corruption due to the atomized tax base, current difficulties in computing tax burdens and the absence of political and administrative controls.

Accountability requires the taxpayers to get involved in government decisions, and we expect this to happen when they make direct contributions to the public budget and are able to influence the way the public funds are spent. Naturally, these conditions are more likely to be achieved with taxes applied to (most) individuals, like the PIT or the property tax.

Table 19. Evaluating Alternative New Taxes for Regional Governments in Peru

	Cohabitation of regional taxes with:						New regional taxes:			
	Central government taxes				Local taxes					
	PIT		CIT	VAT	Land and buildings	Property transfers	IRAP	Elec-tricity	Phones	Green
	labor	capital								
Revenue potential	M	L	M	H	M	M	H	M	M	M
Revenue adequacy	L	L	M	M	L	L	M	L	L	M
Revenue buoyancy (sensitivity to economic cycles)	M	M	M	M	M	M	M	M	M	M
Tax elasticity of tax base	M	H	H	L	L	L	L	L	L	L
Correspondence taxpayers-beneficiaries	H	L	L	M	H	L	M	M	M	M
Efficiency costs / Distortive impact	L	M	H	L	L	M	L	M	M	L
Administrative costs	M	M	L	M	H	H	M	L	L	L
Compliance costs	M	M	L	L	M	L	L	L	L	L
Latitude for corruption	M	M	M	M	H	H	M	M	M	M
Political acceptability	M	M	M	H	L	L	H	M	M	H
Accountability	H	L	L	M	H	M	L	L	L	L
Effect on (increasing) disparities	M	M	H	M	M	M	M	H	H	H
Desirability as a regional tax revenue source	H	L	L	M	M	M	M	M	M	M

H: high; M: medium; L: low.
Sources: Authors' compilation based partially on Bird (2003).

Political acceptability is a key requirement for any modification of the tax system. In principle, it is not realistic to expect much political support for any tax increase, but a reassignment of tax revenues to regional governments might be accepted or rejected due to a sense of entitlement to tax revenues that could be found in Peruvian regions. For instance, regional politicians may gladly support the cohabitation of regions in the VAT, or the implementation of a regional general sales tax like the IRAP and green taxes, if they see that these alternatives are associated with greater fiscal autonomy. On the other hand, local governments might fiercely resist the cohabitation of their property tax bases with the regional governments, as they would interpret the regional share of their revenues as a loss of fiscal autonomy.

The effect of new tax assignments on regional disparities is an important policy consideration for the central government and could plausibly influence the political acceptability of alternative new tax revenue sources for regional governments. We have seen that income, consumption and production are unevenly distributed across regions, which implies that all the alternative tax instruments considered here will likely increase regional disparities. Table 20 presents basic statistics on the variability of those alternative regional revenue sources for which we have information on current collections; the table also shows the correlation between the alternative regional revenue sources and the FONCOR. In general, all sources considered display a high degree of variability across regions. The less variable revenue source is the municipal property tax, which displays a (considerably high) coefficient of variation of 0.6, while the difference between maximum and minimum over average per capita revenues is as high as 1.8 times. The greatest variability is observed in the corporate income tax, which displays values of 1.0 and 4.6 for the same measures of dispersion.

By itself, the assignment of a new revenue source with highly uneven revenue potential can be expected to create additional disparities among sub-national governments. One important problem with the alternative revenue sources we are considering, however, is that their revenue potential is not only unevenly distributed, but also displays a high negative correlation with the FONCOR, which we use here as a proxy for fiscal needs. This suggests that in the process of reform it will be important to combine the assignment of new revenue sources to the regions with greater funds for the equalization transfer program so that no final additional disparities are introduced into the system.

Table 18. Potential Effect of Alternative Revenue Sources on Regional Disparities, 2008 (in nuevos soles per capita)

	Central government taxes				Local taxes		FONCOR
	PIT		CIT	VAT	Land and buildings	Property transfers	
	labor	capital					
minimum	0.5	0.2	1.5	1.4	3.0	0.0	6.4
maximum	49.7	13.4	305.9	275.6	25.0	11.0	134.8
simple average	18.2	4.9	66.6	73.1	12.0	3.5	47.2
weighted average	20.1	4.6	77.7	85.7	11.7	3.8	34.7
standard deviation	14.3	3.7	68.2	68.7	7.2	3.1	39.6
coefficient of variation (*)	0.8	0.8	1.0	0.9	0.6	0.9	0.8
(max - min)/average	2.7	2.7	4.6	3.8	1.8	3.2	2.7
correlation with FONCOR:	-0.53	-0.36	-0.42	-0.48	-0.44	-0.47	1.00

(*) The coefficient of variation is equal to the standard deviation divided by the weighted average.
Source: Authors' calculations based on MEF data.

All in all, there are no ideal revenue sources to increase fiscal autonomy of regional governments in Peru, but some alternatives perform better than others. As suggested before, it seems that the personal income tax on wages and professional income is the most attractive alternative, and that allowing for a piggyback rate range would help to increase the fiscal autonomy gained by regional authorities as well as to improve taxpayers' participation and accountability mechanisms. Other alternatives might seem attractive to increase regional revenues, but they are associated with important drawbacks. The piggyback tax on the VAT would be very effective in increasing revenues, but it would be difficult to administer when tax rates differ across regions. A variant of the Italian IRAP would allow rate variation with lower administrative costs. Co-participation in local property taxes could potentially help to incentivize greater collections of this tax, but it would hurt the already weak autonomy observed at the local level. Finally, the creation of new taxes on electricity, phones or pollution seems very attractive as a way to increase tax collections and regional autonomy, but it would likely create additional disparities among regions.

7. Options for the Reform of Sub-national Revenue Assignments

Improving revenue mobilization of local governments in Peru will require the implementation of several well-coordinated initiatives. On the one hand, the poor performance nationwide suggests that the very assignment of revenue sources could be revised. Governments that are not capable of collecting the revenue potential of their jurisdiction should either be helped to develop the required technical and administrative capacity, or collection might be assigned to another, better-equipped level of government. For instance, the property tax on land and building and the tax on property transfers are currently assigned to district governments, but they might well be reassigned to the provincial level. Provinces may be expected to have technical and financial advantages for the administration, collection and enforcement of these taxes. Similarly, the property tax on is comparatively easier to administer, and thus it could be reassigned to district governments.

On the other hand, the generalized lack of technical and administrative capacity at the sub-national levels calls for a more active role of upper levels of government in developing the technology and the knowledge required to collect taxes. The positive experiences of the semi-autonomous SATs (Tax Administration Service offices) in a number of cities suggest that there is room for a significant increase of revenue collection after the introduction of modern and transparent collection agencies. This experience might not be replicable in all municipalities, but it still provides evidence of positive returns of investment in tax collection capacity.[54]

The situation at the regional level is quite different in that regional governments to the present have not been assigned any autonomous revenue sources and depend completely on central government transfers. Here then reform can almost start from a *tabula rasa.*

In both cases, however, it seems clear that one of the most important objectives of possible future reforms to Peru's system of intergovernmental relations should be to increase sub-national fiscal autonomy and accountability. In this paper we have emphasized the interdependence of the principles of equity and efficiency and the importance of well structured sub-national finances for reaching these objectives.

[54] Von Haldenwang (2010) analyzes the use of SATs in Peru and attempts to explain the causes of their so far successful experience.

In what follows we provide a list of the several measures that could complementarily contribute to increase revenue mobilization in local and regional governments in Peru and help to develop a sound system of sub-national financing.

7.1 Improving Revenue Mobilization at the Local Level

7.1.1 The Administrative Dimension

- *Asymmetric decentralization of tax administration*. Tax administration and tax collections could be assigned only to those local governments that have the means to administer and enforce the collection of their assigned tax instruments. Upper levels of government might temporarily play a subsidiary role by assuming functions that cannot be satisfactorily carried out by certain lower level governments, but in some cases it might be reasonable to consider a permanent assignment of these functions to the higher level.
- *Capacity-building*. The capacity to administer and collect taxes can be built, but many sub-national governments lack the expertise and the resources to reach minimum standards of efficiency. Low-level governments might need technical and financial assistance from upper-level governments in developing their tax administration and tax collection capacity.
- *Subsidized initial investments in revenue collection capacity.* This covers many obvious aspects. For example, in the case of the property tax, the central government could assume responsibility for developing and maintaining the cadastre of properties at a national level and for a certain period of time. Once the cadastre has been developed, the responsibility of maintaining it can be devolved to lower levels of government. Other arrangements are possible, including assigning the responsibility for the cadastre to provincial municipalities and for district municipalities at the regional level.
- *Outsourcing*. The outsourcing of tax administration and tax collection services to private companies may be a feasible and effective alternative to enhance revenue mobilization and even to improve the legitimacy of local taxation (von Haldenwang, 2010). Even though this is still a controversial topic in the literature, some positive experiences involving the outsourcing of tax

collections in Peru that may plausibly be replicated in other jurisdictions. When other options are not as feasible or as effective, this alternative might help not only to increase tax collections, but also to develop technical capacity and tax compliance culture.

7.1.2 The Policy Dimension

- *Reorganization of sub-national revenue assignments*. Provincial governments are currently assigned the tax on vehicle property, which requires relatively low administrative capacity and spending, while districts are assigned the property tax, characterized by complex and expensive procedures. Given that administrative, technical and financial capacities at the provincial level are, on average, significantly superior to the capacities of district governments, it might be reasonable to consider a switch in the assignment of these tax instruments.
- *Modification of the distribution criteria of transfers from extractive industries*. Ideally, the distribution of transfers from extractive industries, currently based exclusively on the location of the extractive industries, should be changed by other criteria that also consider the expenditure needs and fiscal capacity of sub-national governments. In practice, however, such a reform might not be attainable due to the strong political opposition of the current beneficiaries of the system. For this reason, we suggest an indirect approach to reducing the distortionary effects of those transfers, based on a reform—in our view more feasible—of the FONCOMUN.

7.1.3 Reforming the FONCOMUN

- *Introduction of a fiscal capacity measure into the municipal equalization formula*. This reform would make it possible to partially correct for the inequalities and inefficiencies created by revenues from extractive industries, which are distributed on a derivation or origin basis without regard to relative expenditure needs or fiscal capacity. In the short run, or while there are not enough data to produce robust fiscal capacity estimates, it may be advisable to introduce only an adjustment that considers the transfers received from canon,

sobrecanon, royalties and customs duties. In the medium run, when more data are available, a more sophisticated measure of fiscal capacity that takes into account the ability to generate own revenues would help to increase the equalization power of the FONCOMUN even more.

- *Elimination of the minimum transfers of eight monthly UITs*. The measure of fiscal disparity considers the ability of a government to finance its expenditure needs. If fiscal disparity is negative, then the government requires no additional resources to cover its expenditure needs. In this context, the minimum transfer is unnecessary and those resources could instead be used to support other governments in greater need. This measure would increase the equalizing power of the program.
- *Separation of the FONCOMUN into provincial and district components*. The procedure by which the transfer fund is first distributed to provinces and then to districts is unnecessarily complex and leads to undesirable inequalities. Indeed, two identical districts requiring the same financial support might receive different amounts of transfers only because they belong to different provinces. The system would gain in simplicity and fairness by assigning a share of the fund to the provinces (e.g., 20 percent) and the rest to all districts in the country in accordance with their relative fiscal disparities.
- *Increasing the size of the FONCOMUN*. A well-designed equalization transfer program contributes to enhancing equity and efficiency among sub-national governments. The impact of such a program can be expected to increase with the share of the program in the sub-national budget, and in the case of Peru the gains are particularly relevant due to the disparities created by revenues from extractive industries. One possible source of financing might be transfers from extractive industries, which if set as a modest proportion of current transfers or applied only to a portion of future increases in revenues from the extractive industries might enjoy higher levels of political acceptability.

7.2 Alternative Revenue Sources for Regional Governments

- *Implementation of piggyback or "flexible" revenue-sharing schedules for central government taxes*. Regional governments could be given discretion within a range of tax rates on central tax revenues. A good alternative is the labor (wage and professional) income tax, which is paid by those individuals most likely to benefit from regional expenditures. The potential revenues are not substantial with respect to total regional outlays, but this limitation also allows for a wider range of discretion, which could contribute to fostering revenue autonomy and accountability. Still, since a more intensive use of labor income tax rates can lead to a greater push toward informality, these measures should be accompanied by additional tax enforcement efforts and other means to reduce labor informality.
- *Implementation of "fixed" revenue-sharing schedules for local government taxes*. Feasible options for increasing revenue autonomy at the regional level are taxes on the value of properties and their transfer. In this case regional discretion over tax rates might hurt the already limited revenue autonomy of local governments, and therefore in this case such discretion might better be avoided. The participation of regional governments in local tax collection might also promote the involvement of regional authorities in the development of local revenue collection capacity and the control of its performance.
- *Introduction of new taxes at the regional level.* There are not many good options here, but two possible candidates include business license taxes (in the vein of Chile's *patente*) and excise taxes on the consumption of electricity and telephone services.
- *Creation of a new unconditional equalization transfer program/ improvement of the FONCOR.* The implementation of regional revenue autonomy and revenue sharing schemes would most likely create additional horizontal imbalances that could be counterbalanced by additional equalization transfers. One possible strategy is to increase the funds that are distributed by the FONCOR, but at present this transfer is mainly focused on capital expenditures. An alternative solution is to create a new unconditional

equalization transfer program. No net additional resources would be needed if a share of the abundant funds transferred as "ordinary resources" (which are distributed in accordance with historical spending) are redirected to funding the new equalization transfer at the regional level.

8. Political Economy and Legal Considerations

During June and October of 2008 sub-national authorities and the populations of Moquegua and Tacna engaged in intense—and sometimes violent—conflicts about the procedure used to distribute the mining canon between the two regions. Representatives from Moquegua argued that a portion of the canon received by Tacna was actually financed with the extraction of mining resources in Moquegua. On October 30 of the same year, the Congress approved an amendment to the Law of Canon in which it made the mining canon depend on the final amount of the mineral sold instead of the total material processed, a decision that favored Moquegua's position. In order to compensate Tacna for the reduction of revenues, the government later approved the disbursement of conditional transfers to be used for infrastructure investments in the region.

Conflicts between Moquegua and Tacna are indicative of important political and cultural forces shaping the current system of intergovernmental fiscal relations. These two regions are the ones that benefit the most from the income tax levied on extractive industries,[55] and at the time of the conflict they were not able to spend more than 30 percent of their budget on infrastructure investment.[56] In this context, it seems reasonable to conclude that sub-national authorities and the population, at least in areas where the extraction of natural resources takes place, see the revenues from canon, sobrecanon and royalties as their legal right according to national laws and not merely the means to cover their relative expenditure needs. Moreover, it might not be realistic to expect that the same actors will show some solidarity to solve the problems of inequality and efficiency created by the distribution of these resources, or that the central authorities will be willing to assume the political costs of pushing for such a reform.

In this context, a relevant change in the legal framework of the canon, sobrecanon and royalties seems to have been accepted in political circles in Lima as unfeasible in the short run.

[55] The sum of per capita revenues from extractive industries received by regional governments (see Table 14) and local governments during 2008 reached 2,012 nuevos soles in Moquegua and 2,748 nuevos soles in Tacna. Among the other regions only Ancash and Pasco enjoyed per capita revenues greater than 1,000 nuevos soles, while the average was 461 nuevos soles.

[56] See Krehoff (2008), who also provides a summary of the conflict between Moquegua and Tacna.

As a consequence, any solution to the problems of inequality and inefficiencies created by revenues from extractive industries will most likely need to be "indirect."

The alternative strategy suggested in this paper is to avoid the seemingly unrealistic scenario in which sub-national governments have to give up resources that they strongly feel they are entitled to, and instead to focus on reforming the distribution of central government transfers to avoid providing with additional resources those governments with sufficient financing to cover their expenditure needs. In order to implement the compensating mechanism, we have proposed in this paper introducing an adjustment in the distribution formula of the FONCOMUN. This transfer program is currently designed to compensate only for differences in expenditure needs, while the proposed adjustment consists of considering also a compensation for fiscal capacity. An equivalent reform was already introduced into the FONCOR in 2009, a precedent suggesting that this reform might plausibly enjoy some degree of acceptability at the municipal level. Still, the feasibility of the proposed reform is far from guaranteed. The size of FONCOMUN is equivalent to five times the size of FONCOR, so it is significantly more relevant, and any attempt to introduce changes in the distribution mechanism would presumably face relatively more political difficulties. The fundamental question here is whether those local governments now receiving both revenues from extractive industries and revenues from FONCOMUN would feel a less pronounced sense of ownership for the latter than for the former. Of course, it is difficult to anticipate local governments' position on this matter.

Other reforms that could face opposition are those involving the reassignment of revenue sources at the district and provincial levels and the participation of regional governments in local tax collections. District governments currently collecting significant amounts of taxes would have good arguments for keeping the property tax under their control, and they certainly will not like the idea of having their fiscal autonomy reduced. It will therefore be desirable, if possible, to hold them harmless in the revenue dimension. This can be done by limiting and conditioning regional participation in local revenues to the increase of revenue collections. In general, some degree of flexibility will be necessary in order to avoid serious political conflict and blocking of reforms. These reforms can be justified as a means to increase revenue collections only in those areas where collection performance is poor, and regional participation in local revenues should ideally be associated with a "price" paid by regional governments in the form of technical and financial assistance to develop greater collection capacity

9. Conclusions

After more than eight years of fiscal decentralization reforms, the revenue collection performance of Peru's sub-national governments remains at very low levels even when compared to similar countries in Latin America. The sources of the problem, we have seen, are multiple and require a well-coordinated set of reforms. Indeed, more than the necessary improvements in the administrative and technical capacity of sub-national governments, the solution to the problem of sub-national revenue mobilization in Peru will require an in-depth redesign of other important components of the system of intergovernmental fiscal relations.

Potential gains from greater sub-national revenue collections are numerous and significant. On the one hand, sub-national governments would gain revenue autonomy, and this in turn would enhance accountability of sub-national authorities and thus favor more efficient expenditure decisions. On the other hand, greater sub-national revenue mobilization could also serve as an instrument to raise the overall tax burden in Peru. The optimal size of the national tax burden is a topic that goes beyond the scope of this paper; however, provided the country needs to increase government expenditures, greater sub-national revenue collections would help to meet the additional revenue requirements with high standards of efficiency in the revenue and expenditure side of the budget.

To address the core problem of sub-national revenue mobilization in Peru, this paper makes a number of proposals for the reassignment of revenues sources among provincial and district municipalities and for again providing regional governments with their own revenue sources. In the case of municipalities, the property tax now assigned to districts might be reassigned to the provinces, while the vehicle tax now assigned to the provinces might be reassigned to the districts. In order to enhance the revenue yield from the property taxes we also propose a series of administrative and capacity-building measures. Alternatively, the cadastre and property assessment functions could be reassigned to the central or even the regional governments. In the case of the regional governments, this paper explores the possibility of enhancing fiscal autonomy by creating new tax sources in three ways. First, by allowing cohabitation with central government tax bases, regional governments would have a piggyback personal income tax with a flat rate within maximum and minimum margins. Second, by allowing cohabitation with local tax bases, regional governments would have a share of property taxes. Third, there is the possibility of introducing an origin-based regional VAT, a regional

business tax and/or a regional excise tax on the consumption of electricity and telephone services.

Another important problem at present is that a significant share of sub-national resources is not distributed according to the relative expenditure needs of sub-national governments. In particular, the revenues from canon and sobrecanon—the corporate income taxes on extractive industries (mainly mining, oil and gas)—are distributed among regional and local governments on a derivation or origin basis, exclusively benefiting those jurisdictions where the exploitation of natural resources takes place. Given that the presence of natural resources is not correlated with expenditure needs, the current allocation scheme creates severe inequalities and inefficiencies, which can be expected to increase with the importance of this revenue source in sub-national budgets. In recent history, international prices of several key commodities increased drastically during the period 2004-2008, raising the revenues from the canon and sobrecanon up to 13 percent of regional government revenues and 40 percent of local government revenues by the end of that period.

Ideally, the fiscal disparities created by revenues from extractive industries should be resolved by directly reforming their allocation/distributional procedures; however, considering that this option may be politically unfeasible, we have proposed to address the problem in an indirect fashion. The idea is to reduce the amount of equalization transfers received by the governments that already have alternative financial means from the canon and sobrecanon. The reduction of the severe fiscal disparities currently observed at the sub-national level in Peru is, we argue, one of the most relevant policy reform priorities. This is because the reduction of fiscal disparities would help to improve not only the fairness of the system, but also to correct the price incentives faced by sub-national government authorities and thus also increase the efficiency of their expenditure decisions.

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Appendix 1. Econometric Results

Table A1. Determinants of Total Revenue, Own Tax Revenue and Non-Tax Revenue

	Total Revenue Per Capita			Total Own Tax Revenue			Total Non-Tax Revenue		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Age group 0-6	0.0012	0.0014	0.0024	0.0008	0.0008	0.0009	0.0019	0.002	0.0028
	(0.0030)	(0.0031)	(0.0033)	(0.0015)	(0.0015)	(0.0015)	(0.0023)	(0.0023)	(0.0026)
Age group 7-14	-0.0096***	-0.0098***	-0.0102***	-0.0031*	-0.0031*	-0.0033**	-0.0060**	-0.0061***	-0.0064**
	(0.0025)	(0.0025)	(0.0027)	(0.0012)	(0.0012)	(0.0012)	(0.0018)	(0.0019)	(0.0021)
Age group 15 or more	0.0043***	0.0043***	0.0044***	0.0022***	0.0022***	0.0021***	0.0027***	0.0027***	0.0028***
	(0.0009)	(0.0009)	(0.0010)	(0.0005)	(0.0005)	(0.0005)	(0.0007)	(0.0007)	(0.0008)
Total land surface in Km2	0.0004	0.0003	0.0005	0.0005	0.0005	0.0004	0.0000	-0.0001	0.0002
	(0.0006)	(0.0006)	(0.0007)	(0.0003)	(0.0003)	(0.0003)	(0.0005)	(0.0005)	(0.0005)
Poverty indicator head count (%)	-0.4101***	-0.4147***	-0.4461***	-0.3846***	-0.3852***	-0.3770***	-0.2202***	-0.2243***	-0.2613***
	(0.0846)	(0.0849)	(0.0916)	(0.0443)	(0.0443)	(0.0447)	(0.0629)	(0.0632)	(0.0721)
Illiteracy rate, 15 or older	0.3306	0.2731	0.3005	0.2777**	0.2785**	0.2251*	0.1743	0.1152	0.1656
	(0.1826)	(0.1835)	(0.1998)	(0.0964)	(0.0964)	(0.0978)	(0.1357)	(0.1364)	(0.1571)
Population	0.0009***	0.0009***	0.0008***	0.0002	0.0002	0.0002	0.0004*	0.0004*	0.0003
	(0.0002)	(0.0002)	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0002)
District dummy	9.5965**	11.2759***	11.7359**	6.2576***	6.2596***	8.1083***	7.3377**	9.0923***	9.1279**
	(3.3646)	(3.3792)	(3.7203)	(1.6537)	(1.6533)	(1.7210)	(2.5052)	(2.5162)	(2.9327)
Skilled employees ratio	-2.3999*	-3.1251**	-5.1654***	-1.9214**	-1.9469**	-1.9013**	-0.6939	-1.3512	-3.4632***
	(1.1485)	(1.1469)	(1.2104)	(0.6611)	(0.6603)	(0.6601)	(0.9358)	(0.9332)	(1.0192)
GDP per Capita	0.0761	0.0874*	0.1466***	-0.0135	-0.0119	-0.0027	0.0931**	0.1024**	0.1755***
	(0.0394)	(0.0394)	(0.0422)	(0.0230)	(0.0231)	(0.0233)	(0.0313)	(0.0313)	(0.0349)
Agricultural population	-19.3525**	-19.0959**	-27.3854***	-5.6722	-5.769	-4.5166	-11.4194*	-11.0918*	-20.0252***
	(6.0114)	(6.0379)	(6.5177)	(3.1303)	(3.1317)	(3.1568)	(4.4975)	(4.5170)	(5.1467)

Table A1. Determinants of Total Revenue, Own Tax Revenue and Non-Tax Revenue (continued)

Total transfers per capita	0.0325***			0.0001			0.0335***		
	(0.0013)			(0.0007)			(0.0011)		
Canon		0.0326***			-0.0003			0.0340***	
		(0.0013)			(0.0007)			(0.0011)	
Foncomun			-0.022			-0.0446***			-0.0092
			(0.0193)			(0.0107)			(0.0155)
Region and year Dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES
constant	18.2726***	18.2451***	19.1776***	10.0931***	10.0929***	10.0693***	15.6435***	15.5660***	16.6819***
	(0.2233)	(0.2228)	(0.2340)	(0.1487)	(0.1487)	(0.1483)	(0.1912)	(0.1901)	(0.2035)

Notes: Tobit estimates. Standard errors in parenthesis. * p<0.05, ** p<0.01, *** p<0.001

Table A2. Peru: Determinants of Total Revenue at District and Provincial Level

	Total Revenue Per Capita							
	District				Provincial			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Age group 0-6	0.0051	0.0064	0.0068	0.008	-0.001	-0.002	-0.002	-0.0015
	(0.0042)	(0.0042)	(0.0042)	(0.0046)	(0.002)	(0.0050)	(0.0050)	(0.0053)
Age group 7-14	-0.0114***	-0.0118***	-0.0120***	-0.0127***	-0.0117***	-0.0113**	-0.0115**	-0.0104**
	(0.0022)	(0.0035)	(0.0035)	(0.0039)	(0.0022)	(0.0037)	(0.0037)	(0.0039)
Age group 15 or more	0.0035***	0.0036**	0.0036**	0.0037**	0.0050***	0.0064**	0.0065***	0.0061**
	(0.0011)	(0.0011)	(0.0011)	(0.0012)	(0.0001)	(0.0020)	(0.0020)	(0.0021)
Total land surface in Km2	0.0002	0.0002	0.0002	0.0003	0.0005	0.0006	0.0004	0.0013
	(0.0002)	(0.0007)	(0.0007)	(0.0007)	(0.0000)	(0.0018)	(0.0018)	(0.0019)
Poverty indicator head count (%)	-0.5083***	-0.4682***	-0.4736***	-0.4708***	-0.0493***	0.4443	0.4771	-0.2148
	(0.0812)	(0.0870)	(0.0873)	(0.0953)	(0.0049)	(0.3149)	(0.3168)	(0.3343)
Illiteracy rate, 15 or older	0.2735	0.3615	0.3036	0.2573	-0.0039	-0.2111	-0.2919	0.3117
	(0.2051)	(0.1880)	(0.1888)	(0.2083)	(0.0106)	(0.6534)	(0.6567)	(0.6974)
Population	0.0001	0.0006*	0.0006*	0.0005	-0.0001	0.0017***	0.0017***	0.0015**
	(0.0000)	(0.0002)	(0.0002)	(0.0003)	(0.0001)	(0.0005)	(0.0005)	(0.0005)
Skilled employees ratio	-2.175*	-2.6726*	-3.3358**	-5.3579***	-0.2703	0.1154	-1.0650	-2.2532
	(1.450)	(1.1769)	(1.1746)	(1.2355)	(0.2579)	(4.1154)	(4.1094)	(4.3919)
GDP per Capita	0.0660	0.0706	0.0816*	0.1421***	-0.0122***	-0.0947	-0.0908	0.1623
	(0.0106)	(0.0388)	(0.0388)	(0.0415)	(0.0020)	(0.5367)	(0.5387)	(0.5719)
Agricultural population	-18.1402***	-18.7834**	-18.4081**	-26.9090***	-36.284***	-38.5067	-40.7677	-29.7954
	(1.5775)	(6.1545)	(6.1787)	(6.7359)	(3.1550)	(25.2314)	(25.3338)	(26.9432)
Total transfers per capita		0.0328***				0.0315***		
		(0.0014)				(0.0032)		
Canon			0.0331***				0.0317***	
			(0.0014)				(0.0032)	
Foncomun				-0.0606**				0.1728**
				(0.0206)				(0.0655)
Constant		17.149	29.3879**	67.8169***		33.1734	47.5213	68.4627
		(10.5814)	(10.5253)	(11.7618)		(46.3700)	(46.2576)	(51.1916)
Region and year Dummies	YES	YES	YES	YES	YES	YES	YES	YES

Notes: Tobit estimates. Standard errors in parenthesis. * p<0.05, ** p<0.01, *** p<0.001

Table A3. Determinants of Total, Own Tax Revenue at District and Provincial Level

	Total Own Tax Revenue					
	District			Provincial		
Age group 0-6	0.0013	0.0013	0.0017	-0.0008	-0.0008	-0.0007
	(0.0021)	(0.0021)	(0.0021)	(0.0023)	(0.0023)	(0.0023)
Age group 7-14	-0.0018	-0.0018	-0.0022	-0.0055***	-0.0055***	-0.0056***
	(0.0018)	(0.0018)	(0.0018)	(0.0016)	(0.0016)	(0.0016)
Age group 15 or more	0.0021***	0.0021***	0.0019***	0.0026*	0.0026*	0.0026**
	(0.0006)	(0.0006)	(0.0006)	(0.0010)	(0.0010)	(0.0010)
Total land surface in Km2	0.0005	0.0005	0.0004	0.0004	0.0004	0.0003
	(0.0003)	(0.0003)	(0.0003)	(0.0008)	(0.0008)	(0.0008)
Poverty indicator head count (%)	-0.4281***	-0.4283***	-0.4176***	0.0102	0.0104	-0.0081
	(0.0466)	(0.0466)	(0.0473)	(0.1399)	(0.1403)	(0.1391)
Illiteracy rate, 15 or older	0.2750**	0.2756**	0.1973	0.1816	0.1787	0.1926
	(0.1013)	(0.1013)	(0.1034)	(0.2889)	(0.2892)	(0.2897)
Population	-0.0001	-0.0001	-0.0001	0.0009**	0.0009**	0.0009**
	(0.0001)	(0.0001)	(0.0001)	(0.0003)	(0.0003)	(0.0003)
Skilled employees ratio	-2.3100***	-2.3354	-2.2497***	-0.9456	-1.0003	-1.1559
	(0.6794)	(0.6786)	(0.6781)	(2.0076)	(2.0045)	(2.0170)
GDP per Capita	-0.018	-0.0165	-0.004	0.1047	0.1052	0.1168
	(0.0226)	(0.0226)	(0.0230)	(0.2374)	(0.2374)	(0.2376)
Agricultural population	-6.3953*	-6.5220*	-4.6826	0.6706	0.5739	0.6196
	(3.2474)	(3.2492)	(3.2874)	(11.3620)	(11.3648)	(11.4012)
Total transfers per capita	0.0001			0.0015		
	(0.0008)			(0.0016)		
Canon		-0.0004			0.0014	
		(0.0008)			(0.0016)	
Foncomun			-0.0649***			-0.0108
			(0.0121)			(0.0294)
Constant	-9.8363	-9.4219	1.6477	-12.955	-12.0849	-6.3137
	(6.2753)	(6.2523)	(6.5991)	(23.0349)	(22.9162)	(23.7823)
Region and year Dummies	YES	YES	YES	YES	YES	YES

Notes: Tobit estimates.Standard errors in parenthesis. * p<0.05, ** p<0.01, *** p<0.001

Table A4. Determinants of Total, Own Non-Tax Revenue at District and Provincial Level

	Total Own Non-Tax Revenue					
	District			Provincial		
Age group 0-6	0.0043	0.0046	0.0054	0.0001	0.0002	0.0006
	(0.0032)	(0.0032)	(0.0037)	(0.0034)	(0.0034)	(0.0038)
Age group 7-14	-0.0073**	-0.0075**	-0.0080**	-0.0056*	-0.0057*	-0.0047
	(0.0026)	(0.0026)	(0.0031)	(0.0025)	(0.0025)	(0.0028)
Age group 15 or more	0.0021*	0.0021*	0.0021*	0.0046***	0.0048***	0.0043**
	(0.0009)	(0.0009)	(0.0010)	(0.0014)	(0.0014)	(0.0015)
Total land surface in Km2	-0.0001	-0.0002	0	-0.0001	-0.0003	0.0007
	(0.0005)	(0.0005)	(0.0006)	(0.0012)	(0.0012)	(0.0014)
Poverty indicator head count (%)	-0.2586***	-0.2638***	-0.2687***	0.4016	0.4344*	-0.232
	(0.0652)	(0.0654)	(0.0760)	(0.2153)	(0.2178)	(0.2375)
Illiteracy rate, 15 or older	0.2066	0.1464	0.1434	-0.3444	-0.4231	0.1587
	(0.1409)	(0.1414)	(0.1661)	(0.4464)	(0.4512)	(0.4948)
Population	0.0003	0.0003	0.0003	0.0006	0.0006	0.0004
	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0004)
Skilled employees ratio	-0.6727	-1.2726	-3.4458**	0.3966	-0.6728	-1.8404
	(0.9857)	(0.9821)	(1.0688)	(2.8510)	(2.8500)	(3.1937)
GDP per Capita	0.0892**	0.0981**	0.1739***	-0.1403	-0.1396	0.1127
	(0.0316)	(0.0315)	(0.0352)	(0.3670)	(0.3703)	(0.4064)
Agricultural population	-9.8475*	-9.3827*	-19.2468***	-38.8400*	-41.1074*	-30.4101
	(4.6484)	(4.6624)	(5.3942)	(17.2803)	(17.4358)	(19.2038)
Total transfers per capita	0.0347***			0.0300***		
	(0.0012)			(0.0022)		
Canon		0.0354***			0.0303***	
		(0.0012)			(0.0023)	
Foncomun			-0.0355*			0.1714***
			(0.0167)			(0.0474)
Constant	-3.9594	8.6223	45.3302***	41.8051	55.4637	74.1627*
	(8.4597)	(8.3917)	(9.8270)	(32.0829)	(32.0601)	(37.2942)
Region and year Dummies	YES	YES	YES	YES	YES	YES

Notes: Tobit estimates. Standard errors in parenthesis. * p<0.05, ** p<0.01, *** p<0.001

Appendix 2. Examining the Fiscal Effect of Transferring Property Tax to Provincial Municipalities and Vehicle Tax to Districts

As previously discussed, under the current structure districts are in charge of collecting land and building property taxes, while provinces are in charge of collecting vehicle taxes. Unfortunately, around 20 percent of district municipalities are unable to collect land and building taxes at all and base their budgets on non-tax revenue and transfers. Vehicle tax collection is administratively easier to implement, compared to property tax. In Peru, police departments are in charge of the registration of vehicles; this fact, along with import registration, simplifies the collection of vehicle taxes for the provinces. Therefore, we simulate what would happen if the government decides to transfer the land and building tax to provinces, which have stronger administrative structures, and cede vehicle tax collection, which requires less administrative structure, to district municipalities.

The methodology implemented is simple as we assume that the total land and building taxes (property tax and *alcabala*, or property transfer tax) are collected at the province level, and therefore aggregate the actual collections to a provincial level. Given the lack of available district information on cars, we proxy the car density by population density, and distribute the actual collection of vehicle tax by population in the provincial jurisdiction. While the implications of these assumptions may be strong and imperfect, we argue that they are valid for the analysis as districts highly populated will tend to have a higher car density. The estimations also assume that districts would be able to collect the same level of vehicle tax that the provinces are collecting and that provinces are collecting the same level of and building tax, assuming the same level of administrative inefficiency. Therefore, while we assume efficiency in the vehicle tax collection, we are underestimating the property tax and *alcabala*.

As can be seen from Table A5, the straight change would cause a huge loss for districts as property and land and building tax collections account for almost 10 times the collections of vehicle tax. This fact suggests the need for further modifications such as tax sharing between districts and provinces. In addition, the mean of per capita tax collection is higher under the current arrangement. This is due the fact that under the new arrangement we assume that all districts would be able to collect vehicle tax.

Table A5. Fiscal Effect Estimation of Transferring Vehicle Tax to Districts, 2008

	Actual			Estimated		
	Vehicle Tax	**Alcabala**	**Property Tax**	**Vehicle Tax**	**Alcabala**	**Property Tax**
Districts	-	136,363,005	431,061,152	85,610,154	-	-
Max	-	336	869	10	-	-
Min	-	-	-	-	-	-
Mean	-	**5.72**	**11.50**	**0.67**	-	-
Sd	-	20.91	46.73	1.75	-	-
CV	-	0.27	0.25	0.38	-	-
Corr Foncomun	-	-0.032	-0.001	0.420	-	-
Corr Canon	-	-0.002	-0.009	0.120	-	-
Provinces	94,915,346	284,267,733	183,532,652	9,305,192	420,630,738	614,593,804
Max	253	742	126	10	42	46
Min	-	-	-	-	-	-
Mean	**0.44**	**8.19**	**10.74**	**0.44**	**2.09**	**7.40**
Sd	1.27	58.93	15.28	1.27	4.57	9.72
CV	**0.35**	**0.14**	**0.70**	**0.35**	**0.46**	**0.76**
Corr Foncomun	0.4851	0.7129	0.5257	0.4851	0.6092	0.3768
Corr Canon	0.4659	-0.0311	0.2245	0.4659	0.186	0.2981

Notes: In the current scheme provinces receive *alcabala* and property tax as they act as provinces and districts at the same time. Similar conditions apply to the estimated vehicle tax.
Source: Authors' estimations.

Appendix 3. Estimating Potential Revenue Collections by Region from a Tax on Residential Consumption of Electricity

Estimating the revenue potential of all possible options for new regional taxes is particularly challenging due to the lack of information about regional tax bases. Here we use a very simple methodology to estimate the potential revenues from a tax on residential consumption of electricity, which uses information about residential electricity consumption in Peruvian regions and the rates of a similar tax applied in Buenos Aires, Argentina. Electricity consumption tax rates in Buenos Aires province are 10 percent for residential users.[1] Potential regional tax revenues are estimated by applying a 10 percent tax rate on regional residential consumption of electricity. The total amount of tax collections obtained under these conditions, as well as their share of regional expenditures and the resultant tax collections per capita, are presented in Table A6.

[1] Reporte de la Fundación para el Desarrollo Eléctrico: http://www.fundelec.org.ar/informes/info0010.pdf

Table A6. Potential Tax Collections from a Tax on Residential Consumption of Electricity

	Total tax collections (thousands of nuevos soles)	Share on regional expenditures (%)	Tax collections per capita (nuevos soles)
Amazonas	148	0.0	0
Ancash	5,212	0.7	5
Apurimac	1,264	0.4	3
Arequipa	11,454	1.4	10
Ayacucho	1,730	0.4	3
Cajamarca	2,028	0.3	1
Cusco	5,370	0.6	5
Huancavelica	704	0.2	2
Huanuco	2,352	0.6	3
Ica	5,058	1.2	7
Junín	4,869	0.7	4
La Libertad	9,960	1.1	6
Lambayeque	5,690	1.1	5
Lima	n/a	n/a	n/a
Loreto	3,781	0.5	4
Madre De Dios	721	0.6	7
Moquegua	1,381	0.6	9
Pasco	954	0.4	3
Piura	7,957	1.0	5
Puno	3,533	0.5	3
San Martin	2,567	0.4	4
Tacna	2,682	0.8	9
Tumbes	1,249	0.6	6
Ucayali	2,330	0.7	5
Total regions (excl. Callao and Metro. Lima)	82,996	0.6	5
correlations:			
FONCOR			-0.36
Extractive industries			0.56

n/a: not available

Source: Authors' estimations based on information from INEI- Peru, DANE- Colombia and DNP-Colombia.